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TRANSACTIONS,

OF THE

Horticultural Society

OF

LONDON.

Volume VII.

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PREFACE.

In completing the seventh volume of the Transactions of the Horticultural Society, the Council have to congratulate the Fellows on the great advantages already derived from the establishment of the Society, and on the very flattering prospect open to it for the future. It may be said to have given an impulse to the study of Horticulture, not only in this country, but in all quarters of the globe, as is proved by the establishment of numerous Provincial Societies on the same model, and by the formation of similar Institutions in Germany and France, in the West Indies, and other countries.

Of the Provincial Societies, five only were in direct correspondence with the London Society, at the time of the publication of the sixth volume of these Transactions, and as such, received the large silver Medal placed at their disposal. It will be seen by the lists placed at the end of this volume, that this number was increased to nine in the year 1827, and in the year 1828, to thirteen. The number now in correspondence amounts to sixteen, fourteen of whom have awarded the large silver Medal for 1829.

The Collections in the Garden of the Society have received many important additions, and, notwithstanding the losses occasioned by two unfavourable summers, a large proportion of the most interesting of the new plants introduced have been distributed very generally among the Fellows, and dispersed over all parts of the Kingdom. In the ornamental department, the most extensive and valuable of these collections is unquestionably that formed by Mr. David Douglas, whose mission to the North-west Coast of America was announced in the Preface to the last volume. Shortly after its publication, he returned to England, bringing with him even a far greater number of plants and seeds than he had previously sent home. Of the species thus introduced about 210 have been raised in the Gardens of the Society, and after having abandoned the multiplication of those which presented no other interest than as Botanical curiosities, 130 species are now growing, and nearly the whole of which have been furnished to the Fellows, and to the principal Public Gardens in correspondence with the Society on all parts of the Continent. The peculiar value attached to these plants, which are hardy enough to bear our climate without any protection in winter, many of which are also distinguished by their great beauty, has induced the Council to engage the same indefatigable collector to undertake a fresh expedition to the same country, with such additional means and assistance as the difficulties experienced by him in his former journey had rendered necessary.

Mr. Douglas re-embarked on the 26th of October, 1829, under the same protection and promises of assistance on the part of the Hudson's Bay Company, which had formerly been so eminently useful to him. Although no advices have as yet been received from him, it is confidently hoped, that under his present circumstances, still greater benefit will be derived by the Society from this enterprise, than from any former expedition of the kind.

The contributions to the Ornamental Department received from various Public Gardens as well as Private Individuals, Fellows and Correspondents of the Society, both at home and abroad, have also been of considerable importance. Under this head the collection of Chilian Plants discovered and introduced by Alexander Cruckshanks, Esq. and the Mexican Plants raised from the seeds collected by J. G. Graham, Esq. in the Mountains of Mexico, deserve to be particularly mentioned as having furnished many new and beautiful hardy, or half-hardy, species. The Hothouses have been more especially enriched by the Indian Collections transmitted by Dr. Wallich from the Botanical Garden of Calcutta, and presented to the Society by the Honourable East India Company, and also by a considerable number of very interesting plants collected in the neighbourhood of Rio Janeiro, and presented by the late Sir Henry Chamberlayne. To Dr. Wallich the Society is also indebted for a variety of Trees and Shrubs from the Mountains of Nipal, which have proved sufficiently hardy to be placed in the Arboretum.

In the Fruit Department, while the Collections have been constantly augmented by communications with Foreign Gardens, the Officers of the Society, by the direction of the Council, have been diligently applying themselves to the examination of the varieties, with a view of determining their respective merits or demerits. If no result has hitherto been made public, this has arisen from the extreme difficulty of the subject, the repeated trials that are required, year after year, before a final opinion can be formed upon any given variety, and from an unwillingness on the part of the Council to authorise the publication of imperfect statements. Many thousand varieties have now been subjected to the most rigid scrutiny, and if there is still a great mass of matter requiring investigation among Apples and Pears, yet with respect to other fruits, the state of information, acquired at the Garden, is such, that Reports upon a great number of them may be now immediately expected. An account of the varieties of the Pine Apple has already been read before the Society, and will be followed by a constant succession of other Reports which will be printed in the Transactions, and which, it is confidently anticipated, will contain much important information. The details intended to be comprised in these Reports will be best understood from the perusal of them when printed; but in the mean while it may be stated that the great objects that have been kept in view, are the simplification of the nomenclature by the reduction of the synonyms to order; the investigation of the modes of cultivation best adapted to each variety, the effect

produced by different kinds of stocks, and the determination of the respective qualities with a view to rejecting worthless kinds, and selecting the most important only for permanent cultivation. The fruits when gathered are deposited at the Garden in a Fruit Room, which is constantly open to the inspection of the Public, and which, from the number of Visitors to it, appears to excite universal interest.

The distributions made by the Society of cuttings, seeds and plants has been of the greatest importance, as well from the number and value of the articles, as on account of the accuracy with which their names and synonyms have been established. During the three years preceding the 1st of May last, no less than 28,367 parcels of seeds were distributed at the Office in Regent Street, and 37,590 Articles from the Garden ;* during the present year, this proportion has been further extended.

* The following are the proportions in which these articles were distributed in each of the above mentioned years.

	Plants.	Seeds at the Garden.	Seeds in Regent St.	Cuttings.	Total.
1827-28. Articles delivered from May 1, 1827, to April 30, 1828, inclusive.	5,694	3,411	8,424	1,692	19,221
1828-29. Ditto, ditto, in the same period.	5,864	3,304	8,539	2,489	20,196
1829-30. Ditto, ditto, in the same period.	8,104	4,390	11,404	2,642	26,540
Total.	19,662	11,105	28,367	6,823	65,957

With reference to this subject, the Council have to observe that the second of the regulations printed at the commencement of the last volume, has since been rescinded, and that all the Fellows of the Society have now the privilege of applying for plants and cuttings; and when visiting the Garden they may receive such as are in sufficient abundance to be so distributed; the Garden being open from nine in the morning, daily, until six in summer, and until sunset in winter.

The Library of the Society at their house in Regent-street, has continued to receive additions by purchase as well as by donations. The models of fruits, the herbaria, and other scientific collections have been transferred to the Garden, where it is proposed to arrange them in such a manner as to render them of easy access, and to answer as fully as possible the purposes for which they were intended.

With the present volume, it is designed to close the first Series of these Transactions, but, their extensive circulation having proved that they have generally met with the approbation of the Public in their present form, it is not intended in commencing a new series to make any material alteration either in the style in which the plates are prepared, or in the typographical execution of the letter press.

Regent-street,
December 27, 1830.

ADVERTISEMENT.

THE Council of the Horticultural Society, in directing the publication of Papers read before them, take this opportunity to inform the Public, that the grounds of their choice are, and will continue to be, the importance and singularity of the subjects, or the advantageous manner of treating them, without pretending to answer for the certainty of the facts, or the propriety of the reasonings contained in the several Papers so published, which must still rest on the credit or judgment of their respective Authors.

It is likewise necessary, on this occasion, to remark, that it is an established rule of this Society, to which they will always adhere, never to give their opinion as a body, upon any subject either of Nature or Art, that comes before them. And therefore the thanks which are proposed from the Chair, to be given to the Authors of such Papers as are read at the General Meetings, or to the Persons who send fruits, or other vegetable productions, or exhibit Inventions of various kinds to the Society, are to be considered in no other light than as a matter of civility, in return for the respect shewn to the Society by these communications.

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PART I.

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1887.

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TRANSACTIONS

OF

THE HORTICULTURAL SOCIETY.

I. *Observations on the Growth of Early and Late Grapes under Glass. In a Letter to the Secretary. By Mr.* JAMES ACON, *Corresponding Member of the Horticultural Society of London, Gardener to the Earl of* SURREY, *F. H. S. at Worksop Manor.*

Read March 7, 1826.

SIR,

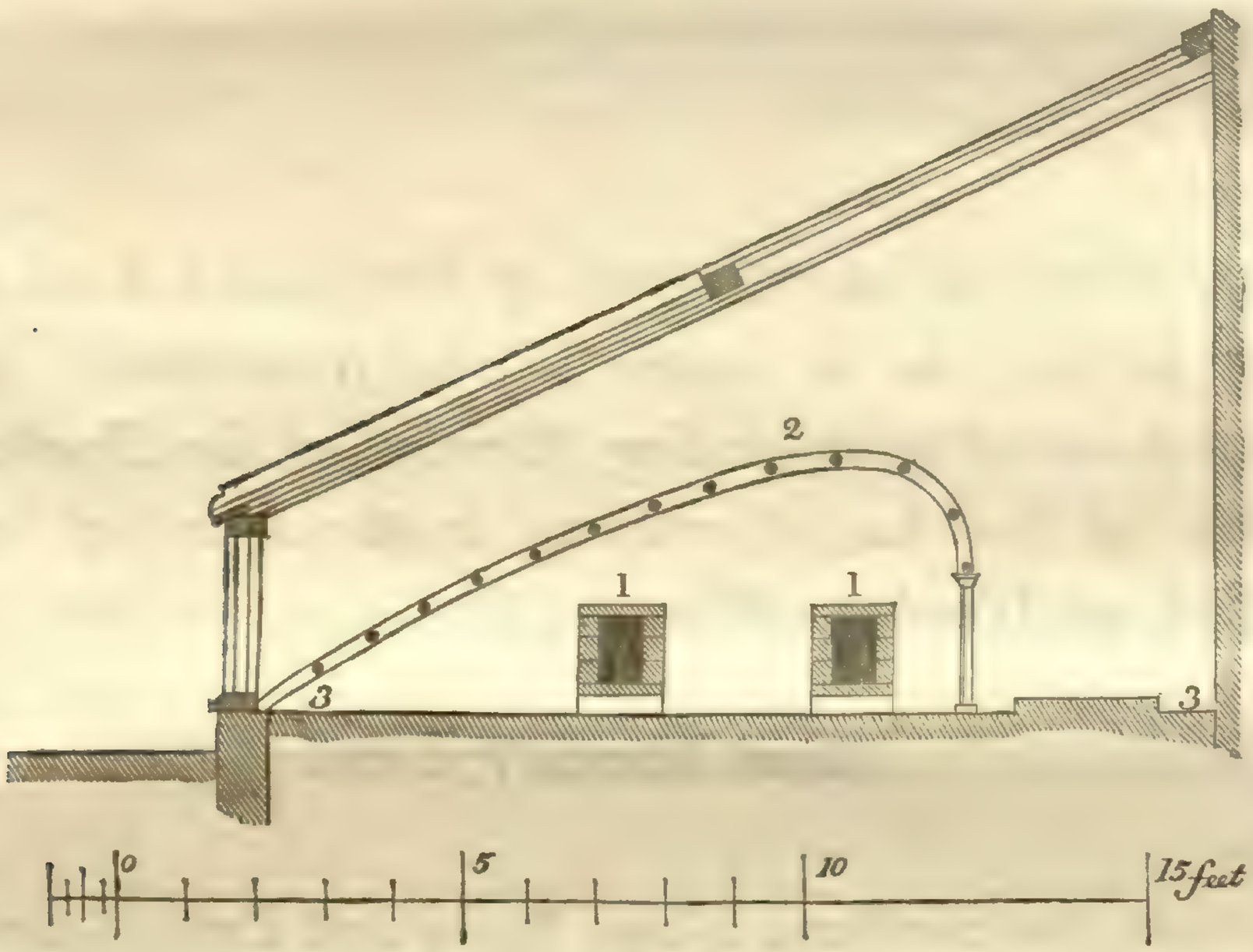
I SEND you the Sections of the Early and Late Graperies at Worksop Manor, agreeably to your desire. The first of these, which was the house you so particularly noticed, had previously been a Pinery, and was reconstructed in the beginning of last year in the present form, to be employed solely for the production of Early Grapes. With the addition of this house to the others in the garden, I am now enabled to provide a regular supply of fruit, in a perfect state for the table, throughout the year. There are very few places in the kingdom where this is successfully accomplished; partly from the injudicious plans on which the early houses are

Mo. Bot. Garden,
1897.

constructed, and partly from the cultivation of Late Grapes being little understood.

In compliance with your request, I now submit to you some observations on the management of Vineries both in early and late forcing, and will begin with the former, referring to the annexed section and explanation thereof.

Early Grapery at Worksop Manor.



References.

1. Flues, eighteen inches high, built on arches.
2. Arched Trellis, with horizontal wires one foot apart.
3. Places where the Vines are planted.

The method usually adopted for early Grapes is to train the Vines under the roof near the glass, or on small frames against flued walls. Both these methods are in my opinion objectionable; in the former the house is rendered much too dark, and the young bunches are liable to suffer from the

currents of cold air that blow through the interstices of the glass in stormy weather; in the latter the plants are frequently scorched, from the intense heat of the flue, and consequently yield very scanty and uncertain crops.

For the Early Forcing, a great command of heat is essentially necessary, to secure which, the house here described was constructed with two flues, that first pass along the middle of the house, and then returns in the back wall; the fires are placed at each end behind; thus the heat is equalized to a great nicety. The operation of forcing commences on the first of September, the fruit begins to be ripened about the first week in March, and continues to be gathered till the middle of May. The Vines are trained horizontally on the trellis and on the back of the house. Some are also trained on the rafters, but these last are introduced six weeks after the forcing of the first has commenced, and they yield a succession crop, which begins to ripen early in May.* The form of this house gives it a peculiar advantage over most others, in presenting a greater surface for the growth of the Vines than could be derived from any other plan; the trellis which covers the flues is nearly equal to the

* At the commencement of this Paper, I stated that I was enabled to provide a regular supply of fruit from my Vines throughout the year. This is effected as follows:—The late-house crop lasts from the middle of January to the end of March; this is succeeded by the first crop in the early house, which carries on the supply into May, and it is continued by the Grapes on the rafters in the same house, until the Vines in the Pine stoves, which are forced early in January and February, produce their crops. These keep in bearing through the summer, when a Vinery, which I begin to force about the end of March, furnishes the supply till the late-house fruit is ready in January. This completes the succession.

whole roof without being in the least detrimental to the plants at the back of the house. To prove the superiority of this trellis, some branches were brought from the Vines growing on the rafters, and trained on the trellis; these ripened their clusters a fortnight sooner than those above, and were exceedingly large and fine.

The Vines are planted in the earth within the house, for I consider it of the utmost importance to have their roots secure from external exposure; but I do not by any means desire to have the mould in which they grow heated by the fire; few plants will thrive well if the earth in which their roots are placed is warmed by any other means than that of the atmosphere.

In pruning these Vines, as little wood should be left to be employed as possible; I prefer stopping one joint above its cluster, and have no joint without a bunch. Some have difficulty in procuring this, but good practitioners generally have abundance. A single Vinery at this place, fifty-two feet long by fifteen feet wide, ripened in the last season one thousand bunches, besides which, the number of bunches cut off at the time of thinning was considerable; those which ripened were allowed by some eminent Gardeners to have acquired all the size and flavour that fruits of the same kind were capable of acquiring.

When the crop is over, and the wood perfectly ripe, the branches should be laid near the ground, and shaded till the recommencement of the forcing. By this practice they will be found to have accumulated excitability. The shade will have some affinity to the gloom of winter, which never fails

to give vegetation increased energy. I remember once to have placed some Vines in pots in the lobby of an icehouse; these being replaced in the stove, broke their eyes in September, and had ripe fruit very early in the spring following, though they were but slowly forced.

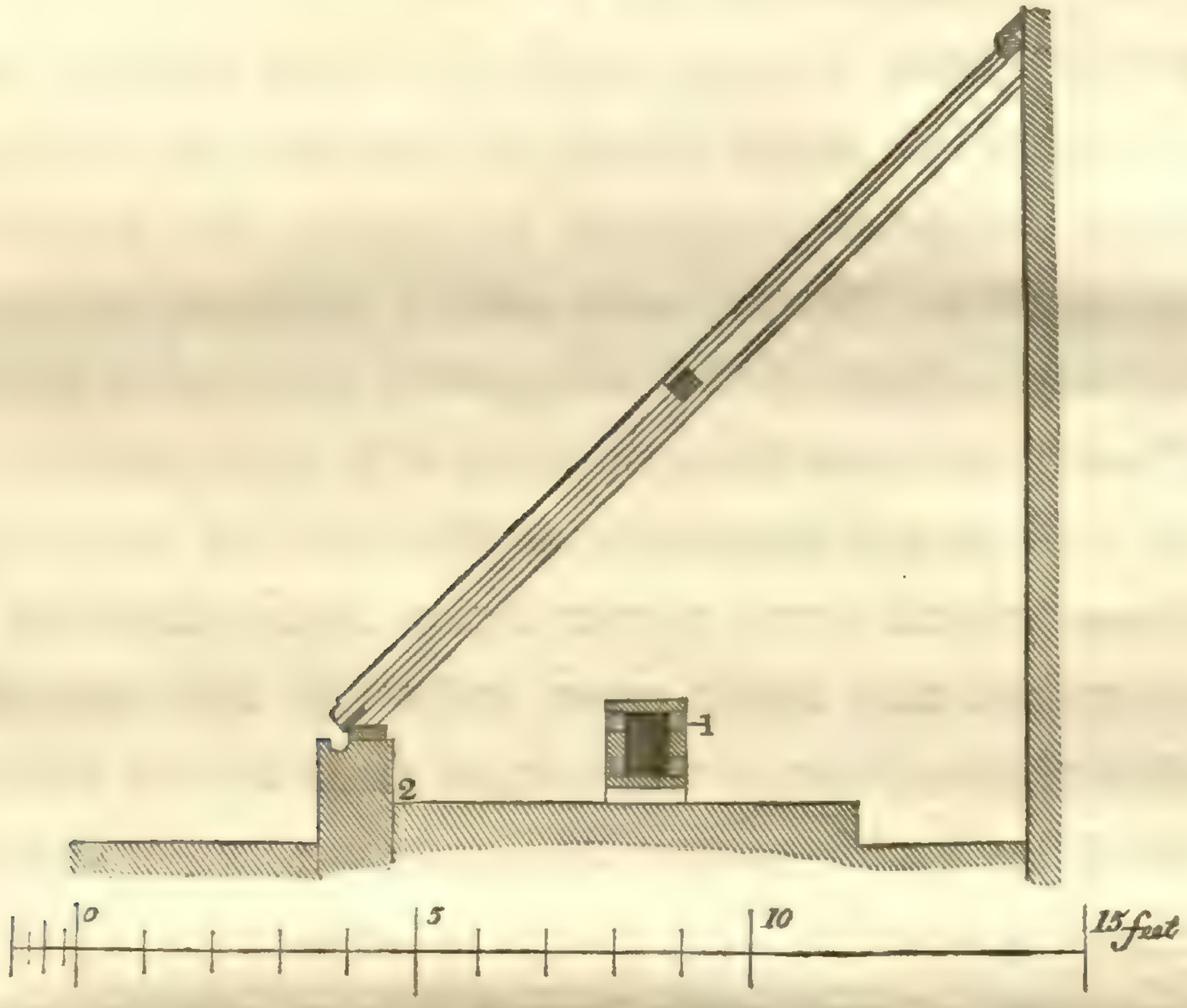
No author that I have read who has written on Early Grapes, seems to have been skilled in their cultivation. Mr. NICOL* found it necessary to reverse his houses to procure ripe fruit in March, and many persons, misled by his authority, have adopted this unnatural method of proceeding. Plants that have been forced early will always shew an inclination to bud at the accustomed time, whilst it is difficult to move those which have never been habituated to forward excitement, but the habit once induced, will continue, and will enable the cultivator to procure fruit at any time. There may indeed be local circumstances to thwart success, but where there is no difficulty, there is no merit.

The growth of my early forced Vines coincides with the season most unpropitious to vegetation, but it is fortunate that the quiescent state of the fruit, which takes place previous to its ripening, and when it acquires no perceptible enlargement, corresponds exactly with the depth of winter. Whatever change it then undergoes is probably more the consequence of time than of temperature.

* Fourth edition of his Forcing, Fruit, and Kitchen Gardener, page 100.

I now proceed to the observations on the management of the Late Vinery, of which I annex a section.

Late Grapery at Worksop Manor.



References.

1. Flues on arches eighteen inches above the level.
2. Place where the Vines are planted.

This house is usually shut up about the middle or end of May, as soon as the bunches become visible. The Vines are trained on a trellis near the glass. Till they are out of blossom, the air is kept very warm. This is of more importance than is generally imagined; the wood which has to bring the future crop will be all made during this period. In a good heat, it will be found to grow more compact, and to receive a form better calculated to produce and ripen fruit under the cold atmosphere to which it is after-

wards exposed. If the house be kept too cool at the beginning, the wood will be soft and long jointed, and therefore subsequently barren. Those who attempt to grow Late Grapes, must pay serious attention to this circumstance, the failures of many may be attributed to the neglect of it. As much air as possible is given during the summer; but as the autumn advances, more caution in this point is observed. I endeavour to have the fruit perfectly coloured at the approach of the dark season; if the colouring be deferred too long, the berries will never acquire their proper flavour. The first object is to ripen the fruit well, after that to maintain a more passive vegetation; if this be well managed, the bunches will remain for months without any apparent alteration. Great care must be observed daily to remove such berries as are inclining to damp, otherwise the whole crop will soon be spoiled. The Muscat of Alexandria, the St. Peter's, and the Black Damascus, are the varieties best adapted for late crops; all the other kinds wither prematurely. The gathering generally commences in the middle of January, and continues till the end of March, at which time the early house is in bearing.

In pruning these Vines, the same system is followed as in the early house, no wood is suffered to remain without fruit; by this I never fail to have an abundant crop. It will sometimes happen that the plants will bleed at the spring dressing; when this takes place, the best means I know of is to keep the house warmer for a few days; this mode of cure seldom fails, the dry heat of one week will compress the wood as effectually as a long winter. When the fruit is all gathered, the house is unroofed for a short time, not with a view of

retarding the plants, but to restore the elastic power of the wood, which all Vines invariably lose, that have been exposed for a considerable time to a dry atmosphere.

If gardeners who have much difficulty in getting their Vines, that have been in the Pine stoves all the winter, to break their eyes regularly, were to turn them out of doors for a few weeks, they would find much benefit from the practice. Every person of observation must have noticed how vigorously and uniformly they break, after having been exposed for some time to frosty weather. Yet many decry this mode of treatment, alleging that they are frequently killed. A great diminution of temperature will condense the sap, and compress the wood exceedingly, but the elasticity may be restored, by washing the branches frequently with cold water in a low temperature, and then they will suffer no injury. A few years ago, when so many Vines failed from the effect of severe frost, those at this place were exposed the whole of the season without the loss of a single plant; and the subsequent crop was uniformly good.

These observations are such as experience and success enable me to supply you with, and I shall feel particularly happy, if they should be found useful.

I have to thank you in an especial manner for the encomiums you passed on the garden under my care, when you visited it in October last, and am

Your most obedient humble servant,

JAMES ACON.

Worksop Manor,
March 2, 1826.

II. *On the Varieties of Cardoon, and the Methods of Cultivating them.* *By Mr.* Andrew Mathews, *A. L. S.*

Read November 7, 1826.

The Cardoon or Cardoon Artichoke, is the Cynara Cardunculus of Linnæus ;* it was known to the older Botanists as Cynara spinosa,† and Scolymus aculeatus.‡ Parkinson,‖ whose Paradisus was published in 1629, called it the Chardon or Carduus esculentus ; in his time it appears to have been much cultivated in Flanders, for he states that " John Tradescant assured him that he saw three acres of land about Brussels, planted with this kind, which the owner whited like Endive, and then sold them in the winter :" he adds " that we cannot yet find the true manner of dressing them," and this appears to be very true, for he mentions that " the Chardon is eaten raw of divers, with vinegar and oyl, pepper and salt, all of them or some as every one liketh for their delight." Caspar Bauhin, who wrote a few years previous to Parkinson, also states that it was so eaten. Subsequently to the time of Parkinson, it got into cultivation in this country, though it is not now very generally seen in English gardens, nor by any means so much used as in France, and the Southern parts of Europe. As an esculent, however, it has much merit, though it requires more skill in

* Linnæi Sp. Plant. Edit. 1, 827, Edit. 2, 1159. Willdenow Sp. Plant. 3, 1691.

† C. Bauhin Pinax, 383. ‡ Tabernæmontani Hist. 1075.

‖ Parkinson Paradisus, 520, pl. 519, fig. 5.

the cooking than is commonly applied to it, which is probably the cause of its not being so frequently grown.

The Cardoon is a native of the South of Europe, and the Northern parts of Africa. Though a perennial, it is used in gardens only in the first year of its growth, except when it is kept over to the succeeding year for the purpose of saving its seed. Mr. NEILL, in his Treatise on Horticulture, published in the Edinburgh Encyclopædia, states that it was cultivated in the Botanic garden at Holyrood House, in 1683. He is the first British writer on gardening, who has noticed more than one variety; he mentions the Cardon de Tours as cultivated by the French, but as not having then (1817) been introduced into Britain.

The French gardeners call these plants Artichaut Cardon, Carde and Cardonette, and have for some time cultivated* two varieties, the Cardon d'Espagne, and the Cardon de Tours, the latter being by them considered the best, because it is said that its ribs are thicker, tenderer, and more delicate. This originated at Tours, and is there much in use. The Bon Jardinier† has lately, in addition to these, mentioned two others, one entirely without spines, and the other with red stems, both of which will be noticed in the following descriptions.

I have included all the sorts known to me under four heads. Seeds of the French kinds, received from M. VILMORIN, have been cultivated in the garden of the Horticultural Society at Chiswick, where my engagement has afforded me an opportunity of examining them. The two first kinds mentioned

* Dictionnaire des Sciences Naturelles, Tome iii.

† See Bon Jardinier for 1825, page 94, and for 1826, page 121.

were also raised from seeds obtained from English and Dutch seedsmen.

The varieties may be arranged and described as follows.

1. Common Cardoon.

Chardon.
Carde. } English.

Cardon pleine inerme.
Cardon pleine et sans épines. } French.

This kind grows from four to five feet high; the leaves are large and strong, with broadish segments to the leaflets, of a shining green, with a little appearance of hoariness on the upper surface, and generally destitute of spines, though some of the plants occasionally have a few small ones at the base of the leaflets. This is the Common Cardoon of the English gardens, and which when raised from English or Dutch seed, is often of very inferior quality, being piped or hollow in its ribs. The Cardon Pleine Inerme of the Bon Jardinier, which is there described as a novelty, appears to correspond exactly with this Common Cardoon of the English, and not to differ from it at all in the character of its foliage, except in having solid ribs. I am therefore disposed to consider it only as our Common Cardoon, raised from seeds of well selected plants.

2. Spanish Cardoon.

Cardon d'Espagne.

The segments of the leaflets of this kind are rather narrower, and somewhat more hoary than those of the Common Cardoon; the ribs are longer, and the whole plant stronger,

and usually rather more spiny; it is not however always very readily distinguished from the Common Cardoon.

3. Cardoon of Tours.

Cardon de Tours.
Cardon de Tours épineux à côtes très pleines.
Cardon piquante.

The leaves of this kind are very hoary on the upper surface, the segments are broad, acuminate, and terminating with a stiff spine; the spines grow from three to five in clusters at the base of the leaflets, they are very strong and of a yellowish colour. This plant does not grow so tall as the two preceding; its ribs are large and solid.

4. Red Cardoon.

Cardon à côtes rouges.

The leaves of this kind are green, without any hoariness, long and narrow. The segments of the leaflets are also much narrower and more acuminate, than in either of the others. The ribs are large, and tinged with a deep pink, but are not solid. The whole plant is destitute of spines. It is less hardy than either of the other varieties. M. Vilmorin received this from M. Delacour Gouffé, Director of the Botanic Garden at Marseilles.

There does not appear to be any real difference as to flavour when dressed in the above described plants; the Spanish Cardoon as grown with us seems to be the best, inasmuch as the ribs are usually larger and more solid than those of the other kinds. The French, as before stated, prefer the Cardoon of Tours. One sort is quite sufficient for all the purposes of

a garden, that therefore which has its ribs perfectly solid and at the same time large, is to be preferred. In the selection of plants from which to save seeds, the Gardener should particularly attend to these qualities.

The Cardoon does not require so much care or trouble in its cultivation, as is often bestowed upon it. There are different methods of managing it, recommended in the books on British and French Horticulture, but as the plan practised in the Garden of the Horticultural Society, in the present and preceding years, appears the most simple, as well as the most successful, I will detail it.

The soil to be chosen for the growth of Cardoons should be deep and light, but not over rich. The seeds are to be sown about the middle of April, in trenches about six inches deep, by twelve inches wide, into which a small quantity of rotten dung has been previously dug. The rows to be set four feet distant from each other, and the seed sown in patches (three or four together) at about eighteen inches apart; when the young plants have acquired four or five leaves, they should be thinned out to single plants. During the summer, they must be kept free from weeds, and in dry weather frequently watered. They require much moisture. About the end of October, when the plants have attained nearly their full size, a dry day is to be chosen, when the plants are free from damp, to commence the operation of blanching, which is thus performed:—The leaves of each plant are carefully and lightly tied together with strong matting, keeping the whole upright, and the ribs of the leaves together. The plant is then bound closely round, with twisted hay-bands about an inch and a half in

diameter, beginning at the root, and continuing to about two thirds of its height, covering the whole so as to prevent the earth, when applied to it, coming in contact with the ribs of the leaves. If the Cardoons are to be used early, and before frost sets in, the plants may remain thus banded without earthing up, and will become sufficiently blanched for use. But if there is any danger of their being exposed to frost, then it is necessary that they should be earthed up in the same manner as Celery; care being taken not to raise the earth higher than the haybands.

A more common practice is, instead of using haybands, simply to tie the leaves together with matting, and then to earth up the plants like Celery; the first earthing to be in the beginning of October, and then repeated once a fortnight until the plants are sufficiently covered. Upon comparison of the plants thus treated in the Garden of the Horticultural Society, with those blanched by haybands, the latter have been ascertained to be superior both in colour and in the greater length of the parts blanched.

A French method of blanching has also been tried in the Society's Garden; it was done in the following manner:—The bottom of the plant was first moulded up a little, the leaves were then tied together with packthread, and the whole nearly to the top was enveloped with a quantity of long clean straw, placed in the direction of its length, and then tied round with strong matting or small ropes; the leaves were thus blanched without being earthed up, and speedily became white. The process is good, and affords a neat appearance, but it is more troublesome than that first mentioned, and much more expensive, because if frost is to be excluded

from the plant, a very large quantity of straw must be consumed for that purpose.

In either of the cases of the use of haybands or straw, it is very necessary to be careful that the plants are perfectly dry before they are enveloped in their covering; they will otherwise rot.

It is frequently the practice to sow the seeds of Cardoons in beds, and to transplant the young plants after they have been so raised, but it has been found preferable to sow the seeds where it is intended the plants should remain, for they are then better enabled to stand a dry summer, and are besides not so liable to run to flower as when they have been transplanted.

In France, the flowers of the Cardoon are gathered and dried in the shade; when so preserved, they are used instead of rennet to coagulate milk.

III. *Accounts and Descriptions of the several Plants belonging to the Genus Hoya, which are cultivated in the Garden of the Horticultural Society at Chiswick. By Mr.* James Traill, *Under-gardener in the Ornamental Experimental Department.*

Read November 7, 1826.

One species of Hoya has been cultivated in the Gardens of this country upwards of twenty years, having been recommended before it flowered by its novelty, and subsequently by the great beauty of its blossoms and the facility with which it is managed. Two other species were subsequently introduced, and at a late period the Horticultural Society has had the good fortune to add two more to those previously obtained.

The object of this communication is particularly to describe and make known these last, and to point out the peculiarities which distinguish the different kinds.

Linnæus was acquainted with only one species of this genus, and that from a single specimen.* His observation of it does not appear to have been sufficient to induce him

* Sir James Edward Smith having very obligingly sent this specimen from the Linnæan Herbarium to Mr. Sabine for his inspection, I have had an opportunity of seeing it. It consists of two separate leaves and a separate umbel of flowers, all so perfect, as to leave no doubt that the whole belongs to Hoya carnosa, called Asclepias carnosa by Linnæus. He received them from Mr. Bladh, a Swede, who had visited Canton; they were given by the Chinese to Mr. Bladh, as belonging to the plant which produces the Gamboge in their country; but Linnæus was not deceived by the attempted imposition. The real Gamboge plant is now known to be Garcinia Cambogia.

to separate it as a distinct genus, and it was included* in Asclepias in the Supplementum Plantarum, published by his son in 1781. Loureiro, who at least saw one species of the genus, and perhaps more, in their native state, referred† them to Stapelia. Mr. Robert Brown first constituted the genus Hoya in the year 1809,‡ in his treatise on the Asclepiadeæ in the Wernerian Transactions, the name being given in compliment to the late Mr. Thomas Hoy, a Fellow of the Horticultural Society, and long known as a scientific and skilful cultivator in his capacity of Gardener to the Duke of Northumberland, at Sion House. The present Baron Jacquin in 1811, uninformed of Mr. Brown's publication, owing to the precluded intercourse between Great Britain and the Continent at that period, in considering the Asclepias carnosa of Linnæus, as belonging to a new genus, called it Schollia,§ after Mr. George Scholl, a principal Gardener in the Imperial Garden of Belvedere, near Vienna; but this name has since yielded to the precedence to which Hoya was entitled.

The plants in cultivation belonging to the genus will be found to agree in the following general characters, the insertion of which in this place will save the repetition of them in the description of each species.

The stem is ligneous, round, flexible, and of a light colour, clinging for support on things near it, and putting out more

* Linnæi fil. Supplementum Plantarum, page 170.

† Loureiro Flora Cochinchinensis, Edit. 1, 1790, page 165; Edit. 2, à Willdenow, 1797, Vol. i. page 205.

‡ Memoirs of the Wernerian Society, Vol. i. page 27; and Hortus Kewensis, Edit. 2, Vol. ii. page 84.

§ Jacquin Eclogæ, Vol. i. page 5, plate 2.

or less from every part fibres resembling those of the Ivy, by which probably, in a wild state, it adheres to the supports to which it is attached. The leaves are simple, opposite, smooth, and fleshy, more or less acuminate, and varying in shape as well as length and breadth in the different species. The peduncles which bear the flowers are produced for the most part from the axillæ of the leaves, sometimes they appear on shoots without leaves, which terminate the branches; they sustain a depressed rachis, from which the flowers arise in a simple umbel. The flower stalk and rachis are permanent, the latter becomes lengthened, and continues to produce the umbels in the flowering season from its extremity. This circumstance makes the careful cultivators of the genus abstain from gathering the blossoms, since each one separated from the plant causes a sacrifice of an umbel which would otherwise last as long as the plant itself. The flowers are more or less fragrant, and are produced in succession, nearly during the whole summer. The stalk of each flower is more than an inch long. The calyx has five small pointed sepals. The corolla is monopetalous, with five divisions, entirely hiding the calyx; the back or external surface is shining; the divisions when the blossom opens, are fully expanded. In the centre of the flower is a starry, shining, wax-like corona or crown, having five pointed pale segments, coloured in the centre. The stamens are included within the crown. The seed vessels are occasionally produced; they resemble those of an Asclepias, being long follicles, containing an abundance of seeds, furnished with long white down at one end, the mass of which has an appearance of silk.

I. HOYA CARNOSA.

The following are the names by which this plant has been published by different authors, with references to their respective works.

Asclepias carnosa, *Linn. fil. Suppl.* 1. *p.* 170. *Murr. Syst. Veg. Edit.* 14. *p.* 260. *Willd. Sp. Plant. Vol.* i. *p.* 1264. *Sims Bot. Mag. tab.* 788. *Smith Exot. Bot. Vol.* ii. *p.* 21. *Tab.* 70. *Persoon Synopsis, Vol.* i. *p.* 275.

Hoya carnosa, *Brown in Wern. Trans. Vol.* i. *p.* 27. *Hortus Kewensis, Edit. alt. Vol.* ii. *p.* 84. *Haworth Synopsis Plant. Succ. p.* 14. *Rœmer et Schultes Syst. Veg. Vol.* vi. *p.* 50. *Sprengel Syst. Veg. Vol.* i. *p.* 843.

Schollia crassifolia. *Jacquin, Eclog. Vol.* i. *p.* 5. *tab.* 2.

Schollia carnosa, *Schrank* according to STEUDEL.

This plant is a native of China, and perhaps also of the neighbouring parts of Asia. It was first introduced to this country from China into the Royal Gardens at Kew in 1802, as appears by the second edition of the Hortus Kewensis above referred to. The Honourable Mrs. BARRINGTON possessed it about the same period, in her garden at Mongewell, in Oxfordshire, (having received it from the vicinity of the Straits of Sunda,) from whence it was figured in the Botanical Magazine in 1804, and in the succeeding year in the Exotic Botany of Sir JAMES EDWARD SMITH. It was sent from this country by Sir JOSEPH BANKS to the Baron JACQUIN, for the Garden at Schönbrunn, in which it blossomed for the first time in 1809.

The stem is rather darker than others of the genus. The leaves are from two to three inches long, ovate, bluntly acuminate, slightly revolute, pale whitish-green beneath,

above dark green, without apparent veins, except on the young leaves where they may be occasionally observed on the upper surface of a dark colour; the whole of the leaves are irregularly blotched or mottled above with spots of a whitish-green colour. The petioles vary from one inch to one inch and a half in length, at first they are of a dark purple colour, but as they become older they assume the same hue as the branches. The umbels are semi-globose. The flowers are extremely beautiful and fragrant, flesh-coloured, frequently mottled with purple at the back, downy within; the segments are rather obtuse, with the sides and ends folded back. The crown is purple in its centre.

Of the three figures above referred to, viz. those of Sims, Smith, and Jacquin, though all have much merit, that in the Exotic Botany affords the best representation of the plant, this figure was copied in 1810, into the German Gardener's Magazine, No. 9, tab. 2. It appears from Steudel's Nomenclator Botanicus, that this plant has been named Schollia carnosa by Schrank, but I have not been able to ascertain in what publication, so that the synonym is noted without a reference.

Loureiro's Stapelia Chinensis was referred to this species by Mr. Robert Brown, in his Essay in the Wernerian Transactions above quoted, on the authority of a specimen from Loureiro's Herbarium, now in the Banksian Collection. This specimen consists of a branch with leaves, and a few separate flowers, it is ticketed Stapelia Cochinchinensis, and is the only specimen referable to Hoya, received from Loureiro. Loureiro has two Stapelias in his Flora Cochinchinensis,*

* Loureiro Flora Cochinchinensis, 4to. p. 165. Idem, Edit. 2, Vol. i. p. 205.

the first called Stapelia Chinensis, the latter Stapelia Cochinchinensis, the first from Canton, the last from the mountains of Cochinchina. Upon an examination of the description of the flowers of the S. Cochinchinensis, that plant evidently belongs to another genus distinct from either Hoya or Asclepias. The flowers of the specimen are certainly those of a Hoya, and therefore cannot belong to LOUREIRO's S. Cochinchinensis; the branch and leaves may be those of his S. Cochinchinensis, for they agree with the description; the flowers and branch of the specimen perhaps therefore belong to different plants. The flower is not that of H. carnosa, and may possibly be from the plant which LOUREIRO calls S. Chinensis, and if so, that species must be considered as distinct from H. carnosa, and this supposition is further confirmed by the consideration of LOUREIRO's description of the leaves of S. Chinensis, which he makes lanceolate, whilst those of H. carnosa are ovate. The leaves attached to the branch in the specimen are shaped like those of H. carnosa, but they are nearly sessile, so that were they belonging to Hoya, they could not be referred to H. carnosa, whose leaves have long peduncles. The result of this examination which Mr. BROWN has been so obliging to make for me, therefore, is, that the S. Chinensis of LOUREIRO is not H. carnosa, but another species of Hoya, perhaps not since observed.

The Hoya carnosa has occasionally produced ripe seeds in this country, from some of which young plants have been obtained. One, which was raised in the garden of CHARLES HAMPDEN TURNER, Esq. of Rooksnest, in Surrey, (by whom it has been presented to the garden of the Horticultural Society) has somewhat paler flowers with smaller and thinner leaves.

The property of attracting wasps and other insects, even when ripe fruits are present, has been attributed to the blossoms of Hoya carnosa, by Mr. JOHN MAHER, in a communication* to the Horticultural Society, in the year 1815. This however appears to have been doubted by Sir THOMAS FRANKLAND, when writing† on the subject in 1820, and subsequent experience has confirmed his suspicions of the accuracy of the fact thus stated by Mr. MAHER. The flowers when in perfection do not appear to be particularly visited by any of the insects which find their way into the houses where the Hoyas are cultivated.

II. HOYA CRASSIFOLIA.

I find this plant only noticed by one writer, to whose work I add the reference.

Hoya crassifolia. *Haworth in Supp. Plant. Succ. p.* 8.

A plant of this species was sent to Mr. REGINALD WHITLEY, from China, in 1817, on board the Wexford East Indiaman, and has since been cultivated and increased in his nursery at Fulham.‡ It is very distinct from, and of much more robust growth than, any of the others. The stems are strong and woody, thickly covered with small irregular warts, whence the stem-roots are protruded. The leaves are obovate, very bluntly acuminate, upwards of four inches long, without veins, of a darkish green colour above, pale beneath. The petioles are thick and fleshy, of a purplish green colour, and much flattened above. The plant grows freely

* See Horticultural Transactions, Vol. ii. page 197.

† See Horticultural Transactions, Vol. iv. page 108.

‡ This information was kindly communicated by Mr. WHITLEY to Mr. SABINE.

in strong heat, but has not yet produced flowers in Europe, it is therefore uncertain whether it belongs to the genus, although it may be presumed so, from its general habit not differing from Hoya.

The specific name of crassifolia, which had been given to the H. carnosa, by Baron JACQUIN, in 1811, has been applied to this plant by an inadvertence on the part of the author above quoted, he supposing JACQUIN's plant to be identical with this one, referring it to JACQUIN's figure in his Eclogæ. Though the Hoya (Schollia) crassifolia of JACQUIN, was published by him in 1811, and was stated in his Eclogæ to have been sent to him from England in 1804, yet Mr. HAWORTH has referred the plant first introduced by Mr. WHITLEY in 1817, to it, and has adopted JACQUIN's specific name, and even stated the large spots on the leaves so conspicuously exhibited in JACQUIN's figure, as distinguishing this plant from the H. carnosa. The name is objectionable, inasmuch as it may occasion confusion in references, and when the plant blossoms so that it can be fully and perfectly described, it will probably receive some other.

III. HOYA PALLIDA.

The following are the references and synonyms which appear to belong to this species.

H. parasitica, *Wallich's MSS.*

H. acuta, *Haworth Rev. Plant. Succ. p.* 4.

H. lanceolata, *Lindley in Donn's Cat. Edit.* 11, *p.* 92.

H. pallida, *Lindley in Bot. Reg. Vol.* 11, *folio* 951.

H. albens? *Miller's (Bristol) Cat.* 1826.

This species was originally introduced to the Royal

Gardens at Kew, in 1818, having been sent from Calcutta, by Dr. Wallich, under the name quoted above from his MSS. with an additional note in his communication to Mr. Aiton, respecting it; "from the Delta of the Ganges." This information was obligingly given to Mr. Sabine by Mr. Aiton. From Kew, it became transferred to the gardens of the nurserymen and collectors in the vicinity of London, where it has been generally known under the name of H. lanceolata. Mr. Haworth, who had seen the plant at Kew, in 1819, published it in 1821 under the name of H. acuta, in his work above quoted, which seems to have escaped the notice of Mr. Lindley when he figured it in the Botanical Register by the name of pallida, which now is generally applied to it. A plant which is sold under the name of H. albens in the nursery of Mr. John Miller of Bristol, is probably the same.

The stem is slender; the leaves are ovate-lanceolate, sharply acuminate, slightly recurved at the points, of a whitish green colour beneath, above darker, with the midrib of rather a lighter colour than the rest of the leaf, and from the midrib, small veins sometimes diverge. The petioles are very thick and fleshy in proportion to the leaves, and of the same colour and texture as the stem. The umbels are semiglobose, sometimes produced in pairs. The flowers have only a moderate fragrance, and are of a pale yellowish colour. The crown is a little paler than the rest of the flower, purple in the centre, with its divisions somewhat channelled.

The plant blossomed for the first time at Sion House, in 1825, and was figured from thence in the Botanical Register, the representation in which is excellent. The specific name of pallida then applied to it, very properly distinguishes it

Hoya Bellii.

from H. carnosa, but a comparison with the other species, will scarcely support its correctness. In H. trinervis, the flower is much paler, and the leaves of H. pallida are when in health, fully as dark, as those of some of the other species. Perhaps any of the three specific names which it had previously obtained, are less objectionable than pallida.

IV. HOYA POTTSII.

This species is a valuable addition to our gardens, for, besides having peculiar beauties, it is of easy culture and it blossoms freely. The late Mr. JOHN POTTS, on his return from China in August 1822, and shortly before his death, gave Mr. SABINE a single leaf of this Hoya, which he had gathered in one of his excursions near Macao; it was carefully planted, and anxiously attended to, until it sent forth a shoot from its base in the spring of 1824. In the autumn of the same year the plant put forth blossom-buds; these dropped off, but perfect flowers were produced in the following year.

In record of the original discovery of the plant by Mr. POTTS, and as a proof of the esteem in which he was held by his employers, the species was named in the Garden of the Horticultural Society in compliment to him.

The stem is slender, greenish-brown, covered irregularly with warts, from which small roots are freely produced. The leaves are cordate, sharply acuminate, having occasionally a rusty stain partly spread over them, beneath of a pale whitish green without veins, above light yellowish green, with three

distinct veins of rather lighter colour than the leaf, from which smaller veins occasionally branch off. The petioles are not particularly thick, and less than half an inch long; they are of the same colour as the stems. The umbels are globose, producing very beautiful pale flowers with the same waxy appearance as H. carnosa, and smelling like the Peruvian Heliotrope, they are of a yellowish colour. The corolla is slightly downy, and much reflexed. The crown has a pinkish centre.

The figure annexed is engraved from a drawing made by Mrs. WITHERS, from the original plant when it first blossomed in 1825.

V. HOYA TRINERVIS.

Several of this species formed part of the extensive and valuable collection of Chinese plants brought home for the Horticultural Society, by Mr. JOHN DAMPER PARKS, on board the Lowther Castle East Indiaman, commanded by Captain THOMAS BAKER, in May, 1824, and they blossomed first in the present year in the Garden at Chiswick.

The plant has a slender, filiform, gray, stem, producing a few warts and roots. The leaves, vary from two inches and a half to four inches and a half in length, they are oblong, very sharply acuminate, beneath of a pale green, and mottled with small brownish red spots, above light yellowish green, with three prominent veins (whence the specific name) for the most part of the same colour as the leaf, but sometimes paler. The petioles are round and thickly covered with a roughish scaly bark of rather a lighter colour than the stem. The umbels are globose. The flowers are pale greenish yellow, and

very highly scented like H. carnosa, but stronger. The corolla is frequently mottled beneath with red, and has sharp pointed segments, the sides and ends of which are much reflexed. The crown is of a pale greenish white, with a yellowish tinge in the centre.

This plant bears a great resemblance to H. Pottsii, from which however it may be principally distinguished by its larger and thinner leaves, the veins of which are more strongly marked, and also by the yellowish colour in the centre of the crown.

These five are all the species which are at present cultivated in British collections. Others are known to exist in their native countries, some from the descriptions of authors, and others from authentic specimens. The whole of the genus is probably confined to the warmer parts of Asia, and the islands or countries contiguous, and in all likelihood is much more extensive than, from our present information, we are enabled to determine. The attention of collectors of plants in those countries should be carefully directed to the Hoyas, because they are not only very ornamental, and consequently desirable, but because they are easy to be transported to Europe.

Of the plants described in books, not yet introduced, the first to be noticed is the Hoya (Stapelia) Chinensis of LOUREIRO, on which some observations have been made in a previous part of this Paper, where it is stated to come from the vicinity of Canton. The next is Hoya viridiflora, named by Mr. ROBERT BROWN, in the Wernerian Transactions, in his Essay before referred to; it is the Asclepias volubilis of

Linnæus's Supplementum Plantarum, a native of Ceylon, and is figured and described in the Hortus Malabaricus, Vol. ix. plate 15, page 25, under the name of Watta-Kaka-Codi. If a judgment may be formed from this figure, the plant is particularly handsome. The Stapelia Cochinchinensis of Loureiro, which has been called Hoya Cochinchinensis, certainly belongs to another genus, as I have already observed. The Asclepias viminalis of Swartz, a native of Jamaica, and considered as a Hoya by Baron Jacquin, under the name of Schollia viminalis, probably belongs to some other genus, no true Hoya having yet been found in any part of the New World. In the Flora Nepalensis of Mr. David Don, page 130, two Hoyas, natives of Nepal, are given on the authority of original specimens, received from and named by Dr. Wallich. The first is called H. lanceolata, the second H. linearis, they both have very small foliage, and would be valuable additions to our gardens.

The specimens which I have had the opportunity of examining, afford evidence of the existence of three hitherto undescribed species. The first is a native of the more northern part of New South Wales, with leaves varying from elliptic to obovate; this is in the Herbarium of Mr. Robert Brown, and is named by him Hoya Australis, it having been referred by him in his Prodromus Floræ Novæ Hollandiæ, Vol. i. page 460, with a doubt, to H. carnosa. The second is also in the same collection, and comes from the Nicobar islands; it has beautiful globose umbels of flowers, which are very numerous in each umbel, and ovate-lanceolate leaves; Mr. Brown has named this Hoya Nicobarica. The last has very narrow lanceolate leaves, an imperfect specimen of which

was brought by Mr. POTTS, from China, in 1822, and is now in the possession of the Horticultural Society; it may be called Hoya angustifolia.

In the cultivation of Hoyas, the most important consideration is the choice of a soil suitable to their nature and habits. The best that I have yet tried for this purpose, and in which I have found them to grow particularly well, is a mixture of fresh vegetable mould, and lime rubbish, in nearly equal quantities. It is not necessary that the compost should be sifted. If it be only broken fine with the spade, and the larger lumps and stones taken out, the plants will be found to root more freely in it, and consequently grow better than they generally do, under the usual treatment in finely sifted earth. Being somewhat succulent, and producing few roots, they must be sparingly supplied with water and but seldom shifted, more particularly if they are grown in a green-house or conservatory, in which they generally make little progress, and flower indifferently. In order to cause the plants to produce their blossoms in the greatest perfection, the heat of a stove is indispensible. They should be trained either to the wall or the rafters, or when small may be made to entwine round sticks in their pots. It is desirable to keep the plants partially shaded, for then the flowers attain a much larger size, and last longer than if exposed to the direct action of the sun's rays.

All the sorts may be propagated with facility, either by leaves or cuttings of the branches. These should be planted in pots filled with silver sand, and placed in a frame where there is a little bottom heat. They will form roots in the course of a few weeks. If strong young plants are im-

mediately wanted, cuttings of the branches must be used, for these generally produce shoots the same year in which they are struck, whereas the leaves seldom make any progress, except that of rooting, until the year following, unless under particular circumstances. In propagating by the leaves, the shoot, which is to become the future plant, proceeds from the base of the footstalk, and the leaf itself subsequently perishes. When first planted, the leaf should be immersed in the mould less than half its length.

IV. *On Acclimatizing Plants at Biel, in East Lothian. In a Letter to the Secretary. By Mr.* John Street, *Gardener to the Honourable Mrs.* Hamilton Nesbitt.

Read July 18, 1826.

Sir,

By your desire I send you my observations on, and account of my practice in, acclimatizing exotic plants, in which it is considered that I have been very successful. I have devoted my best attention to this important subject, and have made more progress than I even expected, during the ten years in which I have been entrusted with the care of the flower garden and pleasure grounds at this place. The following observations, are the result of my own personal experience and practice. In the summer of 1823, I communicated to the Caledonian Horticultural Society a statement of several plants which I had at that time succeeded in naturalizing, and which is printed at page 393, of the third Volume of the Memoirs of that Society.

I find that poor, dry, and shallow earths and declivities are particularly well adapted to preserve many plants through the winter season. The quicker the superabundant fluid passes away from their roots, the better. When excess of rain or moisture, and severe frost happen nearly together, plants generally suffer much more than by dry frost. If the situation of the plants be dry, frost does not hurt them so soon as if it be wet. Many kinds of plants certainly can endure a more uncongenial climate or situation than their native

place of growth. I also find that plants obtained from cuttings are hardier than seedlings, the roots of the former seem to possess more ability to resist severe weather, I therefore plant out cuttings if they are well rooted, in preference to seedlings. Several kinds of plants endure our winters much better while they are small, than when they become large. By keeping some plants short of food, it helps to preserve them in the open air. The last three summers have convinced me how little moisture many plants require. Many kinds of smaller plants, if they are sunk in their pots in the open border, with the hole at the bottom of the pot left open, will endure the winter, which they would not if turned out of pots. Last year I sunk in the open borders, in their pots, Ononis Natrix, Hypericum Balearicum, Teucrium fruticosum, Convolvulus Cneorum, Mesembryanthemum uncinatum, and by this method, and by laying a little sand, or sandy gravel, over the surface round their stems, these plants survived the sharp winter frost without any other protection, and continue in good health.

Under-draining is another advantageous practice. Some small drains, which convey the water from the water pipes attached to the roof of the house at this place, cross a border about eight or ten inches under the surface. Over these drains, and by their sides, I planted out with success several reputed green-house species at several periods. In 1816 I planted Lycium Afrum, native of the Cape of Good Hope, over a drain under a south wall, which is six feet high, and trellised; the plant is covered in winter two mats thick; it thrives remarkably, being nine feet high; and it flowers freely, in some years producing seeds. Over this same drain I planted Lavatera

triloba, a native of Spain; it endured the three last winters well, flowered freely, and produced much ripe seed; this species has endured the winter for the same period in several other places; last year I collected more than sixteen ounces of its seed. In the same place, several years ago, I planted Camphorosma Monspeliaca in its pot; it thrives well, and flowers freely without protection. Lychnis coronata, a Chinese plant, was planted out four years ago, it thrives remarkably well, and flowers freely; I have seen four fine large flowers expanded on it at the same time; last autumn I put some leafy mould over it, so that the crown of its root is four inches below the surface; it is thus much stronger than when in pots, and has now (June 29) many flower buds on it.* Gnaphalium Stœchas, of the south of Europe, was also planted out some years past in its pot; it thrives well, and flowers most abundantly; it ripens seeds, and endures great drought. Another species of Gnaphalium also endured last winter over the drain, remaining in its pot; it succeeds well, and is now in flower; it ripened seeds in 1825.

Several small species of plants may be preserved in the open border by placing an empty flower pot over them during winter. In this way Stachys coccinea, a native of Chile, has been preserved here in very severe winters; it grows well, and ripens seed. I last year planted out Teucrium Marum, which is indigenous in Spain, in the open border in its pot, in a place with a dry bottom, and full exposure, some sandy gravel being put over the surface; it endured the winter without any other protection, and thrives well; flower buds

* August 2, 1826. The above plant of Lychnis coronata had fourteen flowers all opened on it, at the same time.

are now (June 29) appearing on it. Calla Æthiopica, in the open border, produces much ripe seed here; I have two ounces so ripened. Some years ago I sowed the seed of this plant at the end of March, in open ground, in vegetable mould on a clay bottom, placing a portion of an old broken frame over it; it was kept duly moist; in about five or six weeks fifteen plants appeared; they continued to grow all the summer; at the end of the autumn I took them up, potted them, three plants in a pot, and protected them in winter. Afterwards I turned one of the seedling plants into the open ground under a high wall with a west aspect, where the sun cannot shine on it till past twelve o'clock; here it has endured the last three winters with only some decayed tanner's bark put over its roots on the approach of severe weather. It flowers every summer, is now very strong, and at the end of May, and in the beginning of June in this year, it sent up three strong flowers at the same time, full three feet high, although the weather has been so extremely dry; the fourth flower is now (June 29), quite as high, and the plant is likely to produce seed.

Hypericum Ægyptiacum I put out in the open border in its pot several years ago; it still endures the winters, and flowers a long time. I have also discovered that Commelina tuberosa, from Mexico, a reputed stove plant, is hardy, a plant having stood the two last winters in the open border; last summer it flowered and ripened seeds, some of which fell on the border, and produced seedling plants* about the end of May.

* August 2, 1826. These began flowering at two inches high by August 10, 1825, and continued to grow and flower in September. The old plant has now about sixty flowers open together on it.

I covered the old plant with some sand only ; it endured last winter, and is now very strong. Last year its first flowers opened about the 10th of July.

Mimulus glutinosus, a Peruvian plant, I put out in its pot under a south wall in a poor dry place, and laid some sandy gravel on the surface round it ; it endured the last four winters well without covering ; it flowers freely in June, and continues several weeks ; it ripens seed, of which I have above an ounce. The plant is now six feet high ; seedling plants of it flower when two years old.

Marrubium pseudo-Dictamnus, a native of Crete, I put out under a low south wall in its pot, in poor dry earth, in the spring of 1822. It endures the winters and flowers freely, producing ripe seed, which I sowed in a small pot filled with sandy earth, on May 13, 1825. Young plants soon appeared,* and some of them are producing flower buds now (June 29). Disandra prostrata, which comes from Madeira, I planted out in the open border, at some distance from a wall with an east aspect, close to the root of a small Laburnum, on which is grafted Cytisus elongatus ; it is so sheltered and shaded by the plant over it, and the wall, that it only gets the morning sun in a chequered way. On the approach of winter, I put some rather sandy earth about it, and then laid over it some small ornamental stones, shells, &c. with the round side uppermost. By this management it has endured the last three winters, and flowered in the summer. Last year it produced seeds. I put a single Oleander in the open air, in its pot, under a south wall ; it endured last winter with no other protection ; four flowers opened on it at the same time, in the end of June.

* One of these seedlings is a variety with white flowers.

Pittosporum Tobira, from China, has lived several winters in an open border at about eight or nine feet distance from a high wall with a west aspect, where the sun does not shine on it till after 10 o'clock in the morning. It first opens its flowers in May, and these continue several weeks.

In the spring of 1816, I planted out several plants of Broad-leaved Myrtle under a south wall, which is trellised, and six feet high; at the north side, or back, is a terrace, so that the wall is filled up behind with earth to its top, or nearly so. This wall is thirty six feet long; it is wholly covered with Myrtles, and the before mentioned Lycium Afrum. The earth in which they all grow so well, is fine sandy loam, only ten or twelve inches in depth, on a clay bottom. At the approach of hard weather, I cover their roots with moss, and the whole wall of plants two good mats thick, which protection is quite sufficient for them through the most severe winter. These Myrtles flower every year, and in dry summers as plentifully as Hawthorns; last year they flowered from July till the frost came. They then yielded ripe seeds, which I sowed in a rather small pot of sandy earth in April, and several plants were produced, all at present thriving well. This is, I suppose, a rare occurrence in a climate where our latitude is described to be 55° 55′.

I think it right to observe, that I have no assistance in any way, by fires, flues, or stoves, &c. as is the case in many other places. The various reputed green-house plants which grow in open borders here, would require much space to name.

Several kinds of plants which will not stand our winters abroad, and which readily strike root from the cuttings, may be put in a pot, eight or ten together, and protected in winter.

In the following spring they may be separated and planted out in the borders to flower; they are thus more likely to produce seeds than if kept in pots in the common way.

Of Canna Indica I have put out several plants annually, during a period of eight or nine years past, in the open borders in rich earth; they grow, blossom, and ripen seeds, growing near five feet high. Some years this plant sows itself. I have collected two ounces of seed which ripened in the open borders in one season. The seed I sow every year in open ground, in coarse vegetable mould, on a clay bottom on a cold exposed situation, in the following manner. About the middle of the month of May, I dig the earth, and make a drill, as for Peas, about two inches deep; I then put in the seeds, lay on the earth and press it, so as to leave the drill rather concave, or hollow, to enable it to retain moisture; no covering is requisite, but water is given in dry weather. The plants appear in five or six weeks, even when the seeds are some years old; I let them remain until November, when they are become strong, and then take up the plants, with balls of earth, and put three or four in rather a small pot, and keep them in a glass house, giving them larger pots as they grow bigger. These plants begin flowering at one year old, and may be put out in the open border in the end of May, or in June, if the weather is then fair.

Jasminum revolutum, a native of China, has endured the last three or four winters in the open air, under a wall, and begins to flower freely the end of May, or early in June, but has not produced seeds yet. Teucrium flavum, from the south of Europe, I put out under a low south wall, in the spring of 1816; it endures the severest winters in poor dry

earth, and continues a fine, large, bushy plant; it is now (June 29), in full flower. It produces ripe seed, which I sow in a pot in spring; the plants soon appear, they begin to flower at two years old. Coronilla Valentina, a Spanish plant, several years ago, was planted in the open air, under a south wall, remaining in its pot. It endures the winter and flowers freely, dispersing its pleasing fragrance to some distance. This plant has produced an ounce of seed, which ripened in July, 1825; some of it I sowed in a small pot; it soon came up, the seedlings began to flower at ten months old, and the flowers are stronger in colour than on the old plant. I reckon it a good method to revive plants by seed at times, for the flowers so obtained are more perfect in colour and shape. Coronilla glauca, a native of the south of France, has endured several winters in poor dry places under a wall, and flowers well, exhaling an agreeable perfume, and producing ripe seed in abundance in July. One plant of it which I obtained from cuttings taken from a seedling, is unusually large and strong, full seven feet high; it is perhaps a variety of larger growth.

Senecio lanceus,* a native of the Cape of Good Hope, I put out under a south wall, in poor dry soil, in the spring of 1816. The same plant has endured every winter with no other protection; its root is grown very strong; it is, however, killed down to the ground in winter; in spring, it shoots up

* It may be right to record here, that last year I planted out Senecio Ilicifolius among Senecio lanceus; both species were flowering together, and the self-sown seeds of S. lanceus have produced a distinct variety, with leaves very like those of S. Ilicifolius, but of different texture and quality, they flourish like those of S. lanceus, but are larger; it has not produced seeds yet, though flowering plentifully, and it may be a mule. Last year I collected one ounce of seeds, ripened in the open border, from Senecio Ilicifolius.

to full five feet high, flowers and bears seeds in plenty, sows itself all about the dry, gravelly, sandy places, and produces slight varieties; several plants of it which stood last winter in the open borders, are now flowering. Medicago arborea, a native of Italy, I put out in the spring of 1816, in poor dry earth, under a south wall; it stands the severest winters with no other protection, and flowers abundantly during most part of the year, producing seed, of which I have about one pound; it sows itself here under a south wall; the plants become seven or eight feet high.

I am, Sir, very respectfully,

your obedient humble Servant,

JOHN STREET.

Biel, near Dunbar,
June 29, 1826.

Note added by Order of the Council.

In order to bring into one view the whole of Mr. STREET's experience on the important subject of the naturalization of exotic plants, the following Abstract of his Paper in the Memoirs of the Caledonian Horticultural Society, referred to by him at the beginning of the above communication, is added. It is however to be observed, that several of the plants mentioned by Mr. STREET as having been brought to bear the climate of that part of Scotland in which his experiments were carried on, have been long considered as hardy in the more southern parts of the kingdom, those are consequently not noticed, and the plants which are also mentioned in the Paper now published, are likewise omitted.

Mr. STREET had adopted two methods of naturalizing plants: 1st, by exposing them in the open border; 2nd, by raising young plants of exotics from seeds ripened in the open air. This last he considers the most effectual.

By the first means he had induced the following to stand the winter at Biel, in borders, or against walls. Verbena triphylla (Aloysia citriodora), native of Chile, when planted against the wall, was in some years killed to the ground, but shot up again. Cneorum tricoccum, from the South of Europe, flourished in a warm border. Iris Chinensis lived, but required the protection of a hand-glass. Buddleja globosa, native of Chile, throve in a border under an east-aspected wall. Heliotropium Peruvianum grew under a south wall, without protection. Anchusa Italica stood the winter in the open border. Convolvulus Althæoides, of the Levant, lived and grew freely under a south wall. Convolvulus Cneorum, also from the Levant, succeeded equally well in a similar situation. Lonicera implexa, from the South of Europe, stood the winter with the shelter of a wall, as did Lonicera flava, a native of Carolina. Linum Tauricum survived the winter, and attained a shrubby habit, flowering through the whole summer. Agapanthus umbellatus, from the Cape of Good Hope, stood a winter without covering. Sanseviera carnea from China survived the severest winters, and flowered freely in the summer. Phormium tenax, from New Zealand, bore the winters, but did not produce flowers. Veltheimia media, from the Cape of Good Hope, stood in the open ground at a distance from the wall. Alstrœmeria Pelegrina, native of Peru, in an open border, in a deep rich soil, was much more luxuriant than when grown in pots. Erica Mediterranea survived many

winters without covering, in a border in front of a south wall. Edwardsia microphylla, a plant of New Zealand, lived in a similar situation, but without flowering. Melia Azedarach, from the Levant, lived through the winter. Calycanthus præcox (Chimonanthus fragrans), from Japan, stood against a south wall without any covering. Rubus Rosæfolius, from the Mauritius, planted on the open border under a south wall, flourished. Cistus Algarvensis, C. villosus, C. mutabilis, C. Ledon, and C. Ladaniferus, all natives of the South of Europe, were induced to stand through the winters in dry sheltered spots. Teucrium fruticans, from the South of Europe, lived in front of a south wall. Iberis semperflorens, from Sicily, lived in a warm south border without covering. Hibiscus Syriacus stood the winters tolerably. Hypericum monogynum, from China, and Hypericum Coris, from the South of Europe, lived, the first in an exposed, the latter in a sheltered situation. Passiflora cærulea grew against a south wall without covering, and flowered in the summer. Cupressus Lusitanica lived, and produced seeds against a south wall. Smilax aspera, of the South of Europe, grew well under a south wall several years. Acacia armata, native of New Holland, lived over the winter near a south wall, and produced ripe seeds.

The following plants having ripened seeds in the open air; the produce of those seeds, some through successive generations, grew all in the open border, several of them being self-sown. Lopezia racemosa, from Mexico. Veronica decussata, a shrub from the Falkland Islands. Calceolaria pinnata, native of Peru. Pardanthus Chinensis, a bulbous plant. Marica Californica. Persicaria Orientalis. Podalyria Virginica.

Mesembryanthemum glabrum and pinnatifidum, both from the Cape of Good Hope. Lavandula dentata, a shrub from the South of Europe. Stachys coccinea, from Chile. Dracocephalum Canariense, (Balm of Gilead.) Celsia Cretica. Alonsoa Urticifolia, native of Peru. Erodium Hymenodes, native of Barbary. Geranium Anemonefolium, from Madeira. Medicago arborea, a shrub from Italy. Cineraria cruenta, C. Populifolia and C. lanata, all from the Canary Islands. Tagetes lucida, native of Mexico. Momordica Elaterium, from the South of Europe.

To these Mr. STREET observes might be added the names of several annuals, usually raised on hot-beds, which have naturalized themselves by having their seeds sown in the open air in warm situations.

V. *Upon the Culture of Celery. By* Thomas Andrew Knight, *Esq. F. R. S. &c. President.*

Read December 5, 1826.

That which can be very easily done, without the exertion of much skill, or ingenuity, is very rarely found to be well done, the excitement to excellence being in such cases necessarily very feeble. The practice of a very large number of British gardeners, in the management and culture of exotic plants and fruits, and in every difficult department of their profession, probably approximates to, if it have not in many instances attained, perfection; whilst the culture of many of the common esculent plants is still capable of much improvement. I shall at present confine my observations to one of these, the Apium graveolens, or Celery. This plant, under the name of Smallage, a worthless and almost poisonous weed, is found in its wild state growing most luxuriantly in rank soils by the sides of wet ditches, where it can obtain at the same time abundant food and moisture. Without being very well supplied with food, it will not thrive at all in our gardens; and therefore it rarely fails to obtain a proper quantity of manure; but as with this, it is in most seasons found to grow moderately well, the gardener has not paid due attention to the circumstance of its being naturally almost an aquatic plant. I have during several seasons supplied my Celery plants much more copiously with water than is usually done, and always with the best effects; but in the last excessively dry season, I gave

water so profusely that the ground was constantly kept wet; and before the plants were moulded up above the common level of the ground, that to some extent round their roots, was so perfectly saturated with moisture as to wholly preclude the probability of the plants suffering by want of it during the remaining part of the summer. My gardener had not raised his plants at the usual and proper season in the last spring, the seeds not having been sown till nearly the end of April; but nevertheless the plants had acquired in the middle of September nearly the height of five feet. Not the quantity only, but the quality also, of the produce, was greatly improved by the abundant supply of water; for it became, as might have been inferred, more crisp and tender. The rows were five feet distant from each other; but those spaces were not sufficiently wide to permit the plants to be moulded up to the proper height; and this circumstance, joined to the preternatural tenderness of the leaf stalks, caused those to be broken and beaten down so much by the first windy weather, that my crop, though very excellent, was not nearly as perfect as it might have been. The plants also were placed within about eight inches of each other in the rows; and their foliage was so injuriously crowded, that, I believe, I might have obtained as large, if not a larger quantity of marketable produce, if only half as many plants had been used.

I have little more to add to the excellent directions* which Mr. Judd has given in our Transactions for the culture of this plant, except that, I believe, wide intervals between the rows, and between the plants in the rows, when food and water are abundantly given, will be found beneficial. I also

* See Horticultural Transactions, Volume III. page 45.

think that in preparing the bed into which the plants are first removed from the seed-bed, considerable advantages will be obtained by covering a thin layer of dung, not in a very rotten state, with about two inches deep of mould; for under these circumstances, whenever the plants are removed, the dung will adhere tenaciously to their roots; and it will not be necessary to deprive the plants of any part of their leaves. Younger and smaller plants may therefore be used; for their growth, under the preceding circumstances, will not be at all checked; and I need not point out to the experienced gardener, that the younger his plants are, the less subject they will be to run to seed, or pipe, as it is called, in the autumn.

VI. *Report upon the New or Rare Plants which flowered in the Garden of the Horticultural Society at Chiswick, between March,* 1825, *and March,* 1826. *Part* I. *Tender Plants. By Mr.* John Lindley, *F. L. S. &c. Garden Assistant Secretary.*

Read October 17, 1826.

In continuation of my former Report upon the New or Rare Plants which have flowered in the Garden at Chiswick, I now proceed to lay the following additional information before the Society. In this Report, a much greater space than heretofore is occupied by the Hardy Ornamental Trees and Shrubs in the Garden, and as this subject is, next to that of Hardy Fruits, one of the most important to which the attention of the Society is directed, it may be satisfactory to know, that it will continue hereafter to occupy a principal part of all future Reports of this kind. In conformity, however, with the mode of arrangement hitherto adopted, the Tender Plants of the Garden come first under consideration. These occupy the First part of this Report, the Second, which will be printed subsequently, containing the Hardy Plants.

Trees or Shrubs.

I. Mimosa latispinosa. *Lamarck.*

M. spinis petiolaribus sparsis latissimis compressissimis rectis, foliis bipinnatis demum glabris eglandulosis, pinnis 12-20-jugis inermibus, foliolis 10-15-jugis elliptico-oblongis. *Dec. Prodr. 2. p.* 431.

This very rare plant was sent to the Society from the Botanic Garden at the Isle of France in 1822, by Sir Robert

Farquhar, Bart., at that time Governor of the Colony; and it flowered in the stove in November, 1825. It forms an elegant bush, from three to four feet high, remarkable in its tribe for the broad triangular white aculei which clothe the stem and petioles. The stem is downy; the leaves abruptly bipinnate, with many pairs of leaflets, which become smaller towards the extremity; petiole downy, angular, and scattered over with minute black glands, bearing between each pair of leaflets two opposite compressed triangular white aculei. Stipules subulate. The flowers are white, and are produced in many-flowered terminal panicles. Pedicels rufous, glandular and hairy. Heads round, about the size of a pea. The florets are polygamous, and have at the base a single persistent subulate bractea, which is slightly dilated at the end. The calyx is very small, four-toothed, and somewhat truncate. Corolla monopetalous, funnel-shaped, four-toothed. Stamens twelve. Anthers small, round.

Unfortunately no female florets were observed, so that the station of this plant, which has been left in doubt by M. De Candolle, from the flowers and fruit being unknown, is not much more certain now that the flowers have been discovered. It is, however, an undoubted Mimosa, as will appear from the foregoing description, and is, probably, referable to M. De Candolle's second section, *Habbasia*. A tender stove plant, propagated with much difficulty by cuttings, but is most commonly raised from seeds which are received from the Mauritius. It grows freely in a mixture of loam, peat, and sand, in a strong heat.

II. Passiflora obscura.

P. foliis trilobis subcordatis truncatis velutinis: lobis lateralibus divaricatis integerrimis; intermedio obsoleto emarginato, petalis emarginatis calyce minoribus, calycis tubo rotato depresso, coronâ interiore pubescente plicatâ in disco ad basim stipitis incumbente; exteriore radiato, ovario villoso.

This small inconspicuous species of Passiflora flowered in the stove in November. It had been raised from seeds brought to the Society from some part of the North Eastern Coast of South America, by Mr. George Don, in 1823; the precise place at which the seed was collected is not known. The stem climbs to the height of a few feet, and attaches itself by its tendrils to any object within its reach. The leaves are densely downy, seated on footstalks destitute of glands; their form is unequally three-lobed, truncate, somewhat cordate at the base, three-nerved, with the two lateral lobes entire, spreading and slightly falcate; the middle lobe being very short and emarginate, and projecting no further than the line formed by the upper curve of the two lateral lobes. The flowers appear towards the end of the branches, are small, pale-green, with a downy pedicel. Segments of the calyx linear from a broad base, obtuse, slightly downy; the petals shorter than the calyx, generally emarginate at the end, white, half transparent, upon a shallow rotate tube. The disk which surrounds the base of the tube is flat, fleshy, and dilated at top; the inner corona is plaited, incurved, downy, purple, and has its margin applied closely to the projecting margin of the disk. The outer corona consists of filiform rays, of which those of the inner series are clavate at the end, those of the outer as long as the petals, their upper half being white, their lower purple. The stalk of the columna is round, smooth, a little shorter than

the petals, coloured at the end. The ovarium is round, subsessile, and villous.

The species to which this is most nearly related, is evidently the P. Alnifolia of BONPLAND, which seems, from its definition, to be distinguished by the want of hairiness, the length of its peduncles, and the form of the lateral lobes of the leaf. A tender stove plant, easily propagated by cuttings; it grows freely in any light sandy soil.

III. Ixora rosea. *Wallich.*

I. foliis oblongis acutis subsessilibus basi sub-emarginatis subtus pubescentibus, corymbis supradecompositis patentibus multifloris terminalibus axillaribusque, corollæ laciniis cuneato-oblongis acutis.

This is by far the most beautiful of all the Ixoras in our gardens. It grows very freely, has a perfectly good foliage, and produces in abundance its fine clusters of pink flowers, which continue in perfection a long time. The leaves are oblong-ovate, acute, on short stalks, a little cordate at base, coriaceous, shining on the upper surface, a little downy beneath. Corymbs terminal, lax, branched, sometimes nearly six inches broad. Calyx very slightly pubescent, with a few imbricated bracteolæ at the base, and obtuse segments. Tube of the corolla filiform, long. Limb four-parted, reflexed, with cuneate, bluntish segments. Anthers reflexed. Stigma bifid, exserted.

A native of hilly tracts on the borders of Bengal, about Silhet. The plants in the possession of the Society were imported and presented by the Honourable Court of Directors of the East India Company, in 1824, and they flowered freely in the stove in October 1825. Easily propagated by cuttings, under a bell-glass, in a warm frame; it grows readily in a compost of light sandy loam and peat.

Mo. Bot. Garden,
1897.

IV. Ixora undulata. *Roxburgh.*

I. foliis lato-lanceolatis acuminatis undulatis, panicula laxa terminali, sepalis acutis, filamentis antheris æqualibus, stigmate bifido, baccis depressis.

A branched shrub about four feet high, with compressed glabrous branches, and ovate-lanceolate, acuminate, thin, wavy, smooth leaves, seated on very short stalks. Flowers white, or palish yellow, in supradecompound, brachiate, downy, thyrsoid panicles. Calyx small and smooth. Corolla with four linear, reflexed, obtuse segments, half the length of the tube. Anthers linear and spreading. Stigmas two, exserted.

This is a desirable shrub in a collection of hot-house plants, and is remarkable among the species of Ixora for the white colour of its flowers, which passes away into a bright straw colour. Brought to the Society from the Botanic Garden, Calcutta, by Mr. John Potts in 1822. A tender stove-plant, native of forests in Bengal, and flowering in this country in June. Propagated like the last, but with rather more difficulty; and cultivated in the same manner.

V. Diomedea argentea. *Kunth.*

D. sericeo-lanata, argentea, foliis lanceolatis acuto-mucronatis basi angustatis integerrimis. *Kunth Synopsis* II. 470.

A half shrubby plant from two to three feet in height, with round downy shoots, and opposite, entire, spatulate, distant, cæsious leaves, which often, by a contraction of one of their sides, become a little distorted. The flowers grow singly from the extremity of the branches, on long, clavate, somewhat angular stalks. The involucre is campanulate, and double; the outer of six or seven unequal, fleshy, occasionally leafy divisions; inner equal to the outer in number, thin,

membranous, ciliated at the edge, and united with the others at the base. The ray is yellow, the disk purple. Florets of the ray female, ligulate, revolute, five-toothed at the end; of the disk hermaphrodite, tubular, slightly ventricose in the middle, smooth. Receptacle paleaceous, flat; paleæ as long as the florets, transparent, ciliated, spatulate, purplish at the end, covered with resinous glands at the back. Anthers not awned at the base. Ovaria square, smooth, covered by a cyathiform, toothed, membranous pappus, which is the same both upon the florets of the ray and of the disk.

Seeds of this plant were collected upon the small Island of the Grand Cayman, by Mr. GEORGE DON, in 1822, and brought home by him in the following year. It is, undoubtedly, the plant which KUNTH describes as having been collected in Cuba by HUMBOLDT and BONPLAND, but I doubt whether the Peruvian Buphthalmum lineare, which is cited as a synonym, is the same plant. I have never observed any trace of the denticulations on the side of the leaves, which the botanists who have described B. lineare point out. A neat shrub, flowering in the stove in October, and emitting, when rubbed, a strong aromatic odour. Propagated by cuttings; it grows readily in a light sandy loam.

VI. Camellia Euryoides. *Lindley.*

C. ramis debilibus pilosis, foliis ovato-lanceolatis acuminatis truncatis serratis subtus sericeis, floribus solitariis turbinatis, pedunculis squamosis. *Bot. Register fol.* 983.

The grafted part of a Camellia, brought from China in 1822, by Mr. JOHN POTTS, having perished, the stock sprang up, and proved to be this species, which had been before unknown to botanists. It forms a diffuse bushy plant, with

hairy branches, obovate, acuminate, serrated leaves, and small, neat, white flowers, never expanding fully, but in size resembling those of a Thea. It is inferior in beauty to any of the previously known Camellias, but must be considered a subject of much interest to the cultivator, from its being one of the means employed by the Chinese for propagating the ornamental species of the genus.

The stock of another Camellia, brought from China in 1824, by Mr. John Damper Parks, and which had also perished, produced this species. A figure and description will be found in the Botanical Register, fol. 983. It requires the same treatment as other Camellias.

VII. Solanum dealbatum.

S. suffruticosum, undique tomento stellato incanum, foliis petiolo costaque subtus aculeatis, inferioribus subsinuatis superioribus integris, racemis axillaribus paucifloris, calycibus subaculeatis.

A neat undershrub, covered all over, except the inside of the petals, with stellate, white tomentum. The stem is erect, nearly simple, round, very white, with a few slender, straight, fine, scattered prickles. Leaves seated on stalks about half an inch long, oblong-lanceolate, obtuse, flat, a little oblique at the base, with the costa beneath occasionally prickly like the stem. Each leaf has usually two small leaves in its axilla. The flowers appear in axillary, few-flowered racemes toward the end of the branches, and are pale lilac, with long yellow anthers. Calyx five-parted, with ovate, acuminate lobes, occasionally aculeate. Petals ovate, plaited. Anthers smooth, equal, yellow. A hardy green-house plant, seeds of which were procured for the Society from Chile in 1824, by Mr. Place. It thrives very well in the open border

during the summer, and flowers from June to the end of August. It may be propagated by cuttings, but it is frequently raised from Chilian seeds.

It is satisfactory to be thus enabled to add a new and very distinct species to the leprous division of Solanum. That now described is related to S. leprosum and to S. Elæagnifolium, both natives of the same country, but it is obviously distinguished from either by its smaller, nearly entire leaves, by the position and strength of its prickles, and by the other characters assigned to it in the above definition.

A native of the lower parts of the range of Cordilleras which separate Chile from the province of Mendoza, where it appears to be not uncommon. There are specimens in the Herbarium of the Society collected by Mr. M'RAE on the Chilian side of the mountains. Seeds of a slight and more alpine variety were also sent to the Society from the neighbourhood of the city of Mendoza, by their valuable correspondent Dr. GILLIES, but the latter, unfortunately, did not vegetate.*

VIII. Alstonia venenata. *R. Brown.*

A. foliis quaternis oblongo-lanceolatis acuminatis basi attenuatis, cymis dichotomis, corollæ tubo sursum ampliato, limbo imberbi acuto, folliculis utrinque attenuatis folium vix æquantibus. *R. Brown in Wern. Trans.* I. *p.* 77.

Presented to the Society in 1824 by the Honourable Court of Directors of the East India Company, being then imported by them. Requires to be cultivated in a stove, where it flowers in July. The plant in the Garden has grown to the height

* Since this Paper was read, the species has been published by Dr. HOOKER in the Botanical Magazine, tab. 2697, under the name of Solanum saponaceum.

of three feet, and is quite smooth in every part. Stem round. Leaves whorled in fours, lanceolate, acuminate at each end, nearly sessile, with very numerous veins proceeding at right angles from the costa to a marginal vein. Flowers white, in terminal cymes. Bracteæ subulate, much shorter than pedicels. Calyx very small, five-parted, ovate, acute. Corolla an inch long, hypocrateriform: the tube inflated at the end. Limb contorted, five-parted, with ovate, acuminate, spreading segments, which are cordate at the base; orifice of tube a little hairy, with a fleshy entire rim: in the inside very villous. Hypogynous scales none. Anthers placed in the inflated part of the tube, subulate, smooth, bright yellow, surrounding the stigmas in a cone. Ovarium double, seated in a fleshy yellow disk, which has on each side a tooth opposite the commissure of the ovaria. Style filiform, simple. Stigmas mitreform, bright green, contracted in the middle, intruse at the base.

Propagated by cuttings; it grows well in sandy peat and loam.

IX. Wrightia tinctoria. *R. Brown.*

W. foliis elliptico-lanceolatis ovatisque acuminatis glabris, ramis corymbisque divaricatis, corollæ tubo calyce duplo longiore, folliculis distinctis. *R. Brown in Wern. Trans.* I. *p.* 75.

A bushy stove plant, occasionally throwing up vigorous shoots which twine round any thing that is near them. The leaves are opposite, oval, taper-pointed, lanceolate, of a membranous texture, and quite smooth. The flowers are white, and appear in July in small trichotomous racemes from the axillæ of leaves on the old wood; they are remarkable for a delicate five-lobed fringe with which the orifice of their tube is surmounted.

Brought from the Botanic Garden, Calcutta, in 1822, by

the late Mr. JOHN POTTS. Propagated, though with much difficulty, by cuttings; and requires to be planted in light sandy loam with a little peat.

X. Tabernæmontana gratissima.

T. foliis oblongo-lanceolatis undulatis glabris, dentibus calycinis ovatis acutis, corollæ laciniis convexis difformibus crenulatis, cymis divaricatis, floribus cernuis.

In many respects this resembles T. coronaria of ROXBURGH, from which it is distinguished by the form of the teeth of the calyx, and by the direction of the cymes, which are not erect, but recurved, and by the form of the segments of the limb, which are not flat, as in T. coronaria, but convex, much twisted, and exceedingly uneven at the margin. In some of these particulars it may be compared to the T. recurva of the Hortus Bengalensis, but that plant is to be readily known by its large leafy calyx, smaller flowers, and more robust stature, and, I believe, is not yet in this country. The plant in the possession of the Society was imported in 1824 by the Honourable Court of Directors of the East India Company, and presented by them then to the Society. When in flower, it diffuses a delicious fragrance.

A lactescent shrub, requiring the protection of the stove, where it has attained the height of three feet. The stem is much branched, and covered with a cinereous spotted bark. Young branches round, dark-green, spotted here and there with ash-colour. Leaves membranous, stalked, oval, smooth, dark-green above, paler and veiny beneath. Cymes growing by pairs from between the petioles, almost horizontal, with a stalk about as long as the petiole, quite smooth, biternate. Pedicels short, thick. Calyx five-toothed, with ovate-lan-

ceolate, imbricated, entire segments. Corolla yellowish white, hypocrateriform ; tube longer than limb, slightly ventricose towards the orifice ; limb much twisted, smooth, with convex, oblong segments, undulated at the margin ; orifice fleshy, contracted. Stamens included, with hairy filaments, which are adnate to the corolla. Anthers not sagittate, oblong, acute, with linear cells, and a rigid, fleshy connectivum. Pollen white. Ovarium roundish, two-lobed, acuminate, not seated in a discus, two-celled, with its ovules all buried in the substance of a fleshy placenta. Style bulbous at base, filiform. Stigma capitate, with a two-lobed apex seated on a fleshy base.

A valuable stove-plant flowering in September, and propagated by cuttings ; it grows freely in a compost of loam, peat, and sand, mixed in equal quantities.

XI. Sarcocephalus esculentus. *Afzelius.*

Plants raised from seeds, collected in Sierra Leone by Mr. George Don, in 1822, and then sent home by him, having flowered, I am enabled to complete the account given of this species in Vol. v. of the Transactions, page 442, by Mr. Sabine. The flowers which were produced in the stove in July, appeared in terminal heads about twice the size of a musket ball, and were of a pale straw-colour, not pink, as represented in the figure published in the Transactions, and highly fragrant. The calyxes were all united together into a solid fleshy body, having their limbus only distinct ; the latter is short, five or six-toothed, erect, and fleshy. The corolla was funnel-shaped, fleshy, five or six-lobed, with erect, oblong, imbricated lobes. The stamens were equal in number to the segments of the corolla, and alternate with them, inserted

under the sinuses, and enclosed within the tube. Tube smooth inside. Anthers erect, linear, smooth. Style filiform. Stigma fleshy, conical, white, with a furrow on each side and a ring round the middle.

I have thought it necessary to be thus particular in my notice of this plant, for the purpose of correcting the error as to the colour of the flower, which was before given on the authority of the collector, and because it belongs to a genus which has been seen by few botanists in any state, and, I believe, by one only besides myself, in a fresh state. Grows freely in sandy loam and peat, in a strong heat.

XII. Bignonia pallida. *Lindley*.

B. foliis oppositis unifoliolatis oblongis obtusis basi subcordatis, floribus axillaribus subsolitariis, pedicellis calycibusque lepidotis. *Bot. Register, fol.* 965.

For this the Society is indebted to Mr. GEORGE CALEY, who sent it from the Botanic Garden of St. Vincent's in 1823. It grows in the stove to a considerable height, and in its native country forms a small tree, not a climber, as are most of the species commonly cultivated in this country. It is one of the few Bignonias, the leaves of which are simple. The flowers are about two inches long, of a delicate lilac colour with a yellowish tube; they appear in July and August in pairs from the axillæ of the branches, are of a very delicate texture, and quickly perish.

Propagated by cuttings planted in pure silver sand, and covered with a bell-glass; it should be afterwards grown in a light sandy loam. A coloured figure and full description may be found in the Botanical Register, fol. 965.

XIII. Tephrosia? Chinensis.

T.? fruticosa, foliis 9-10 jugis oblongis obtusis utrinque pubescentibus, racemis axillaribus horizontalibus compositis multifloris, calycibus $\frac{1}{3}$ bibracteolatis, corolla pubescente, stylo glabro, stigmate capitato.

A small tree with a greyish warted bark. Young branches dark green, obscurely angular. Leaves unequally pinnate, about a foot long, spreading; petiole channelled above, tumid at the base, and closely clothed with minute appressed hairs. Racemes axillary, or opposite the leaves, about six inches long, horizontal, compound. Flowers fascicled, about three or four together, arising from a fleshy protuberance of the rachis, bright rose-colour, pedicellate. Calyx downy, with two minute, appressed, subulate bracteæ at the base, campanulate, tapering into a flattened cone at the base, bilabiate; the upper lip broad, slightly emarginate, the lower three-lobed, with ovate acute divisions, of which that in the middle is the broadest. Corolla slightly downy. Vexillum erect, roundish, with inflexed margins, concave, with a greenish spot at the base. Alæ horizontal, rather shorter than the vexillum, obovate, obtuse, entire, auricled at the base, parallel with the carina, to which they are glued, as it were, at the base. Carina obtuse, falcate, truncate at the base. Stamens diadelphous; those in front being the longest. Anthers roundish, nearly equal. Ovarium few-seeded, villous. Style incurved, smooth. Stigma capitate.

The fruit of this plant being unknown, the genus to which it belongs cannot with accuracy be determined. My principal motive for referring it to Tephrosia, is the near affinity it appears to bear to M. De Candolle's first section of that genus,

which consists of Roxburgh's East Indian Robinias, and especially to T. suberosa, from which I should even believe it not distinct, if that plant were not described to be destitute of the two little bracteolæ which I find at the base of the calyx of this.

Brought in a living state from China, in 1822, by Mr. John Potts. A greenhouse plant flowering in June, and propagated with considerable difficulty by cuttings. It grows readily in any light sandy soil.

XIV. Calyptranthes Caryophyllifolia. *Willdenow.*

C. arborea, paniculis lateralibus, foliis elliptico-ovatis integerrimis. *Willd. sp. pl.* II. *p.* 975.

A fine stove plant sent to the Society from Sumatra, by the late Sir Thomas Stamford Raffles, in 1822. It is a small tree with virgate branches and compressed twigs, rather thinly clothed with leaves. The latter are flat, oval, coriaceous, acuminate, with a channelled stalk; minutely dotted, with very delicate veins running in simple parallel lines, nearly as far as the margin, within which they become confluent into a line parallel with the edge of the leaf. The panicles are crowded, many flowered and trichotomous, appearing from the old wood. Calyx nearly entire, obsoletely four-toothed. Petals four, white, cohering into a little cap, which is pushed off by the elongation of the stamens; these are numerous, but inserted in a nearly simple row, just within the edge of the calyx. Filaments white. Anthers small, pale. Ovarium inferior, two-celled, with many mis-shapen ovula attached by their middle to a projecting fleshy placenta. Style straight, weak, a little arcuate. Stigma simple.

Flowers abundantly in August, and is propagated by cuttings planted in silver-sand, under a hand-glass in a warm frame. It is easily cultivated in a mixture of light sandy loam and peat, in equal proportions.

HERBACEOUS PLANTS.

XV. Hellenia abnormis.

H. labello subrotundo emarginato, foliis ovali-lanceolatis glabris acuminatis versus apicem ciliatis, ovario uniloculari monospermo, stylo glabro.

This addition to the genus Hellenia was brought from China in the year 1824 by Mr. John Damper Parks, and flowered in a bark-bed, in September 1825. In beauty, it has little to render it worthy of regard, but in structure it is too remarkable to be passed by unnoticed, especially as it forms an addition to a genus, few of the species of which are accurately known.

It grows to the height of ten or twelve inches, having its slender erect stems closely covered with dull green leaves. These have a split vagina which is coloured with red, and extends about a quarter of an inch higher than the base of the leaf, in the form of two obtuse, unequal, ciliated lobes. The form of the leaves is oval-lanceolate, tapering to each end, especially towards the point, where their margin is furnished with fine ciliæ. Flowers small, white, in terminal, slightly compound, erect racemes, which are shorter than the uppermost leaf. Calyx as long as the tube, white, contracted at the end, which is slightly three-lobed and reflexed. Outer limb of the corolla three-parted, with equal, linear, white, spreading segments, which are hooded at the apex.

Inner limb consisting of one segment only, the labellum, which is roundish, complicate, emarginate at the apex, and slightly crisp at the edge; at its base crimson, of which colour are also two erect teeth, which adhere to the upper segment of the upper limb at the orifice of the tube, and which represent the two absent divisions of the inner limb. Filament opposite the labellum, elongated a little beyond the insertion of the anthera in the form of a short round lobe. Anther erect, oblong, entire, with its two longitudinal lateral lobes approximated at the extremities, but curved outwards on each side, so as to form a passage for the style. Style filiform, smooth, longer than the filament, in a furrow of which it is retained, having, at its base, two short fleshy glands. Stigma fleshy, hollow, three-cornered, with a few ciliæ on its lower margin. In all the flowers I had an opportunity of examining, the ovarium was constantly of a spongy texture, with a single cell lying out of its axis, and containing one perfect ovulum obliquely inserted into the bottom of the cell. As I had occasion to dissect the ovaria of several flowers at different times, I conceive that this must be considered to be the natural structure of the species, although it is entirely at variance with the usual character of both the genus and the order. For this reason I have called it Hellenia abnormis. The flowers of this plant are the smallest with which I am acquainted in Scitamineæ.

A hardy stove, or perhaps green-house plant, easily cultivated in a light sandy soil, and propagated by division of the root, like other Scitamineæ; it likes moisture, and grows best in strong heat.

XVI. Gesneria Douglasii.

G. herbacea; radice tuberosa, foliis in medio caulis verticillatis petiolatis ovatis crenatis, cyma terminali umbellata pedunculata, corollæ limbo subæquali, glandulis duabus superioribus dilatatis: inferioribus obliteratis.

A beautiful herbaceous plant, with a fleshy tuberous root, sent to the Society from Rio Janeiro by Mr. David Douglas in 1825. The specific name it has received, is a tribute to the merit of that indefatigable and intelligent collector. It flowers in the stove during almost all the summer, requires to be cultivated in a moderately light sandy soil, and is propagated with some difficulty by the leaves.

From a fleshy roundish root rise two or three purple downy stems, which are naked, and incrassated at the base, and crowned about six inches from the ground with a whorl of five, six, or seven, stalked, spreading, ovate, serrate-crenate, ciliated leaves, which are downy, with a fine gloss on each side. From the centre of these leaves is produced a purple downy peduncle, rather longer than the stem, bearing a large, umbellate, many-flowered cyme. At the base of each ray of this cyme, is a subulate bractea. Pedicels round, long, slender, smooth and shining. Calyx inferior, with a five-parted limb and ovate, nearly equal, short segments. Corolla tubular, half an inch long, fleshy and gibbous at the base, rather downy, of a pale pink colour, striped and bordered with numerous blood-red, interrupted, or continuous spots; its limb is crisp and nearly erect, the upper lip two-lobed, with rounded, imbricated lobes, the lower three-lobed, with equal, ovate, obtuse segments, about the same size as the upper; the recesses of the divisions of the limb are gibbous externally.

Filaments smooth. Anthers cordate, cohering, smooth. Glands at the base of the ovarium two, large, ovate, yellow, on each side of the upper division of the calyx. Ovarium almost wholly superior, downy. Style continuous with the ovarium. Stigma capitate, minutely papillose, perforated in the middle.

The above description renders it apparent that the species now described differs materially from G. tuberosa and its allies, not only in the degree of separation of the calyx and ovarium, but also in the form of the limb of the corolla, and in the number and position of the glands which are found at the base of the ovarium. It is not however advisable on this account to form it into a separate genus; but it may stand as a remarkable species.

XVII. Sinningia Helleri. *Nees.*

A curious herbaceous plant sent from Rio Janeiro by Mr. David Douglas at the same time as the last. The stem is about a foot high, closely covered with numerous bright-green fleshy leaves, from among the uppermost of which appear singly in the axillæ pale-green flowers, resembling in form those of Gloxinia speciosa, but not so large; they are seated on an enlarged calyx having five prominent wings, and remain in perfection many days. A succession is also maintained during nearly all the months of summer.

A coloured figure and description, taken from plants in the possession of the Society, have been published in the Botanical Register, fol. 997. It requires the same treatment, and is propagated in the same manner as the last.

It may be proper here to add, that another variety has been presented to the Society by Mr. John Henry Masters,

Nurseryman, of Stoke Newington, in which the flowers incline more to a lemon-colour, and which has the orifice of the corolla beautifully dotted with minute brownish purple.

XVIII. Calathea flavescens. *Lindley.*

C. acaulis, foliis oblongis acuminatis penninerviis petiolatis glaberrimis concoloribus subtus glaucis, capitulo sessili ovato multifloro, laciniis limbi interioris obovatis oppositis emarginatis. *Bot. Register, fol.* 932.

This pretty little stemless plant was sent with other things from Rio, by the late Mr. John Forbes, in 1822. The leaves are broad, oblong, stalked, finely nerved across, and whole coloured on both sides. The flowers appear in sessile heads, proceeding from the base of the sheaths of the leaves, and are placed among rigid cuspidate bracteæ. They are pale yellow, consisting of three external lanceolate segments, and two broad oblong opposite interior ones. The flowers are produced in succession from the beginning of August to the end of September.

A figure and description is published in the Botanical Register, fol. 932, from a plant in the possession of the Society. A stove-plant, thriving well in a loamy soil, and is easily propagated by division of its root. It requires to be treated in all respects as other Scitamineous plants.

XIX. Commelina cucullata. *Linnæus.*

C. corollis parvis sub-æqualibus, foliis ovatis nervosis ciliatis, involucris cucullatis turbinatis.

A creeping annual, with cæsious downy leaves, and small pale-blue flowers appearing from among the curious hooded

spathas. Raised from seeds communicated to the Society from the Botanic Garden, Calcutta, by the Honourable Court of Directors of the East India Company in 1824.

Flowers in the stove in October. This plant has little beauty, but is noticed here in order to fix the date of its introduction. It is easily cultivated in light sandy loam.

XX. Cleome rosea. *De Candolle.*

C. herbacea inermis glabra, foliis 5-foliolatis infimis floralibusque 3-foliolatis, summis ovatis sessilibus, siliqua glabra thecaphori longitudine. *De Candolle prodr.* 1. 238.

A beautiful tender annual, requiring the same treatment as Balsams. The flowers are of a bright rose-colour, appearing from May to October, and are borne at the end of numerous ascending branches, proceeding from a fine upright central stem, so that when in perfection they give the plant the air of a vegetable Candelabrum. It is to be raised from seeds, which are produced sparingly in long drooping pods.

Sent to the Society from the neighbourhood of Rio Janeiro by Mr. JAMES M^{c}RAE, in 1824. The whole plant has a faint smell of Elder. A figure and description taken from plants in the possession of the Society, have been published in the Botanical Register, fol. 960.

XXI. Gynandropsis pulchella.

G. foliis pilosiusculis integris: inferioribus 5 superioribus 3-foliolatis, siliqua ovali glabra, seminibus reniformibus tuberculatis.

A pretty little tender annual, seeds of which were sent to the Society from Maranham, in 1825, by ROBERT HESKETH, Esq. It flowers in June and July. The stem is nearly simple, about

a span in height, angular, smooth, and stained with purple. Leaflets on the lower leaves five, small, lanceolate, smooth, with a hairy petiole; the exterior ones smaller, with dilated partial footstalks; on the upper leaves, the leaflets are only three, obtuse, the middle one being the largest. Racemes terminal, simple. Flowers small. Petals white, with thin purplish claws, which are barely longer than the discus. Stamens unequal, the upper one very long, reflexed, the lowest one very short. Ovarium nearly four-cornered, roughish.

This species differs from Gynandropsis pentaphylla, in its small stature, and in having its leaves always entire, never serrulated. From G. palmipes it is distinguished by the upper leaves being ternate, and by the absence of a membrane connecting the foot-stalks of the leaflets. It may be grown in any light sandy soil.

XXII. Aspidistra punctata. *Lindley.*

A foliis longè petiolatis, perianthio octofido. *Bot. Register, fol.* 977.

A new species, brought to the Society from China in 1824, by Mr. John Damper Parks. It flowered in a bark-bed in February and March, 1826. From the species previously known it differs in its paler and much larger flowers, which are dotted over with livid purple, and divided into eight segments. The leaves are also elevated higher above the earth than those of Aspidistra lurida.

An obscure but curious stove-plant growing freely in peat and loam, and propagated by division of the roots. A figure and description have been published in the Botanical Register, fol. 977, from the plants cultivated in the Garden at Chiswick.

ORCHIDEOUS PLANTS.

XXIII. Rodriguezia planifolia.

R. foliis binis planis lineari-lanceolatis utrinque attenuatis enerviis, racemis recurvis, bulbis compressis foliis brevioribus.

Among a collection sent from Rio Janeiro in 1825, by Mr. DAVID DOUGLAS, were several bulbs of this plant. It appears to grow naturally upon decayed bark, forming a cluster of long, two-edged, compressed, slightly furrowed bulbs. From each of these bulbs arise two spreading, linear-lanceolate, nerveless leaves, tapered off at each end, and very little more than twice the length of the bulbs. From the base of the latter arises a recurved raceme of greenish-yellow flowers, a little longer than the bulbs and leaves taken together. These have in every respect so much the structure of Gomeza recurva, figured in the Botanical Magazine, tab. 1748, that there can be no doubt of their near relation to that plant; but I cannot bring myself to believe that they are absolutely the same, although it appears from the 660th figure of the Botanical Cabinet, which is a good representation of this species, that Messrs. LODDIGES do not distinguish the two plants. The differences which I perceive between Mr. DOUGLAS's plant and that figured in the Botanical Magazine, necessarily occur to me from a consideration of the drawing in the latter work, the original plant in the Apothecaries' Garden at Chelsea not having been seen by me. But the obvious general correctness of that figure induces me to believe, that confidence may reasonably be placed in it as far, at least, as is necessary for my present purpose. In the figure in the Botanical Magazine, I perceive that the bulbs are ovate, and the leaves lanceolate, widening gradually towards the upper

extremity, strongly plaited, and many times longer than the bulbs. But in the present species the bulbs are very long and almost linear, and the leaves linear-lanceolate, by no means widening to either extremity, with no trace of plicatures, and scarcely more than twice the length of the bulbs. These will be considered sufficient grounds for distinguishing the two plants as species.

With respect to the genus, I have elsewhere * shown the very near proximity of Gomeza to Rodriguezia; a more careful examination of this plant has satisfied me that the two genera must be united. I would therefore name the subject of this article Rodriguezia planifolia, distinguishing it from R. lanceolata by the leaves being flat, and from R. (Gomeza) recurva, by their not being plaited. Their other differential characters have been already indicated. A tender stove epiphyte, preserved with difficulty by being planted in rotten wood, or decayed vegetable matter.

XXIV. Liparis foliosa. *Lindley.*

L? reflexa Bot. Reg. fol. 882 in textu.
Cymbidium reflexum Br. Prod. 331.

L. foliis radicalibus inæqualibus lanceolatis integris acutis carnosis racemo subæqualibus, labello oblongo retuso, clinandrio integerrimo. *Bot. Register, fol.* 882.

This was presented to the Society, with many other curious New Holland Plants, by Captain M'Arthur, in 1825, and no doubt is the Cymbidium reflexum of Mr. Brown's Prodromus. Upon comparing it with the Isle of France L. foliosa, described by me in the Botanical Register, fol. 882, I see no reason to doubt its being the same species; that plant which flowered in Mr. Barclay's stove, and which I there de-

* Botanical Register, *fol.* 930.

scribed, was destitute of bulbs, but the plant of the Garden was furnished with large ovate oblong bulbs, each of which was terminated by three ligulate acuminate channelled leaves indistinctly five-nerved. The scape was about the same length as the leaves of that shoot which produced it, but much shorter than the full grown leaves of the old bulbs. The differences that seem to exist I am disposed to believe depend upon the age of the plant, which, when old, would have bulbous stems, of which it would be destitute when young. The pollen masses were four, collateral, and not cohering in their earliest state by any kind of process or matter, as far as I could discover.

A tender stove-plant; flowers in December. It requires the same kind of cultivation as the last.

XXV. Cœlogyne fimbriata. *Lindley.*

C. foliis binis oblongo-lanceolatis patentibus, floribus terminalibus solitariis: sepalis interioribus filiformibus; labello fimbriato bicristato. *Bot. Register, fol.* 868.

A pretty little creeping plant, brought from China in 1824, by Mr. JOHN DAMPER PARKS. The leaves appear upon small bulbs connected together by a tough perennial prostrate caudex, by which the plant may be increased. The flowers grow from the bosom of the leaves, either singly or together; they are pale yellow, with a beautiful fringed lip, spotted, and marked with brown. They endure several days.

Figured and described in the Botanical Register, fol. 868, from a plant which flowered in the Garden of the Society. The blossoms appear from July to October. Cultivated as others of its tribe.

XXVI. Brassavola nodosa.

B. foliis carnosis semi-cylindricis subulatis canaliculatis, labello integerrimo.

Among some curious plants sent in 1825 from Rio by Mr. David Douglas, were received a patch or two of an epiphyte with numerous fleshy, half-cylindrical, subulate, channelled leaves of a dull green colour tinged with purple. These, after some months vigorous growth, produced in October 1825, two spikes of snow-white flowers, which from some unknown cause did not expand, but which arrived at a state sufficiently perfect to enable me to ascertain that the plants were referable to the genus Brassavola of Brown, and to the Epidendrum nodosum discovered by Jacquin in the Island of Baru, and figured by him in his Selectarum Stirpium Americanarum Historia, tab. 140. Jacquin states the flowers to diffuse a most delicious fragrance during the night. Should be grown in decayed wood, or bark, in which a little moss may be mixed.

XXVII. Dendrobium crumenatum. *Swartz.*

Onychium crumenatum. Blume.

D. caule ramoso terete folioso basi bulboso, foliis ovato-lanceolatis, spica terminali, floribus distantibus geminatis odoratis glabris, sepalis æqualibus ovatis acutis calcaris longitudine, labello rhombeo-ovato integerrimo.

Two varieties of an Air-plant of Sumatra, were sent to the Society by the late Sir Thomas Stamford Raffles in 1823; one of which produced its flowers in the stove in August, 1825. They do not appear to be distinct from each other, but may perhaps constitute both the D. crumenatum and spatulatum, taken up by Linnæus from Rumphius. Their blossoms are very fragrant, but quickly perishable; their colour a

pure delicate white; they appear upon the leafless extremities of the shoots in racemes of four or six flowers. The shoots branch much, and form a compact bushy plant, their lower ends having a tendency to become fusiform and bulbous.

Cultivated readily by being attached to a stump of decaying wood, on which it grows freely. It is among the most easy of all the tribes of Orchideous plants for artificial cultivation. Propagated by division of the branches.

Both the above named varieties appear to be comprehended by Dr. BLUME in his definition of Onychium crumenatum. A lilac variety is also noticed by the same indefatigable Botanist.

XXVIII. Oncidium pubes. *Lindley.*

O. bulbis subcylindricis monophyllis, foliis lanceolatis nervosis, panicula simplici multiflora subsecunda, sepalis 4 fasciatis: inferiore minore bidentato, labello pandurato, columnæ alis linearibus obtusis, stigmate rostelloque pubescentibus. *Bot. Register, fol.* 1007.

Received from Rio Janeiro in 1825, having been sent by Mr. DAVID DOUGLAS. This species has a contracted dwarf habit, and is remarkable for the yellow olive-green colour of the flowers, which appear in the stove in March. The leaves grow singly upon round, elongated, smoothish, deep green bulbs, and are peculiarly characterized by an appearance of plaiting, which is very unusual in the genus. The margin of the stigma and the anterior part of the clinandrium are also singularly pubescent.

A detailed description with a coloured figure of this has been published in the Botanical Register, tab. 1007. It is cultivated with some difficulty in decayed wood, or leaf mould.

BULBOUS PLANTS.

XXIX. Brodiæa Ixioides. *Sims.*

B. coronæ foliolis subulatis. *Bot. Mag.* 2382.

Roots of this curious species were received in 1825 from Dr. John Gillies, a valuable correspondent of the Society, resident at Mendoza, in South America, and flowered in May, a few weeks after their arrival. Bulbs round, small, with a light brown skin. Leaves weak, linear, lying on the ground, sub-glaucous, smooth, shining, a span long. Stem very slender, erect, round, somewhat glaucous, about a foot high or a little more. Spatha of two membranous subulate bracteæ, the length of the peduncle. Flowers two or three. Peduncles an inch long, round. Corolla funnel-shaped, light ultramarine blue, with a greenish tube, and a six-parted spreading limb, about an inch across, of which the segments are frequently laciniated irregularly; the inner series being the narrowest. Stamens three, small, in the middle of the tube. Processes three, fleshy, round, fusiform, inserted at the summit of the tube opposite to the inner laciniæ, and white.

A figure of this has been published in the Botanical Magazine, fol. 2382; but it is uncharacteristic. The plant will thrive very well in a cool frame out of the reach of frost, but the attempts which have hitherto been made to establish it in the open border have all failed.

XXX. Gilliesia graminea. *Lindley.*

A full description, with a figure, having been published of this plant in the Botanical Register, tab. 992, it is not

necessary to offer many observations upon it in this place, as from its want of beauty it is out of the pale of Horticulture, and can be considered only as a Botanical curiosity. The roots were collected about Valparaiso by Mr. JAMES M^cRAE, while touching at that port on his voyage to the Sandwich Islands. They were found by him in a withered state in February 1825, were received at the Garden in the latter end of July of the same year, and flowered for the first and only time in the September following. The genus was named in honour of the gentleman mentioned under the foregoing head.

An obscure little bulbous plant with narrow linear flaccid leaves, and a weak round stem. The flowers are green in loose umbels of about five flowers.

XXXI. Griffinia hyacinthina. *R. Brown.*

G. foliis oblongis breviter petiolatis, umbella 9-10-flora, sepalis oblongo-lanceolatis acuminatis undulatis, spatha tubi longitudine.

A few roots of this beautiful Lily having been collected by the late Mr. JOHN FORBES while at Rio in 1823, several individuals of them have since that time produced their flowers. They differed in no respect from the originals imported in 1815, by Mr. GRIFFIN, and the circumstance of their having flowered in the Garden of the Society is noticed here chiefly for the sake of stating that none of them indicated any disposition to vary, or to approach in form or habit either of the other two species of Griffinia now known. They thrive well and flower freely in October and November, if kept in the constant heat of the stove and planted in light rich sandy loam.

XXXII. Uropetalon longifolium. *Lindley.*

U. foliis lineari-ligulatis acuminatis debilibus, racemo laxo paucifloro, floribus cernuis, sepalis obtusis. *Bot. Register, fol.* 974.

Upon examining a collection of dried plants formed for the Society by Mr. Forbes, and received after his death, in 1824, there were observed in a bundle believed to be the produce of Mafmale, a small island off the coast of Mozambique, a few bulbs, which did not seem to have entirely lost their vitality, although they must have been packed among the specimens at least a twelvemonth previously. The foliage and flowers adhering to these bulbs shewing them to be a new species of Uropetalon, they were transferred from the Herbarium to a Stove, in which they flowered in August, 1825. The flowers proved to be of a dull bluish-green, appearing sparingly in a long simple raceme; the leaves were long, narrow, and quite flaccid. The plant did not therefore exhibit any pretensions to beauty, but it forms an interesting addition to the genus, which at present consists of only a few species.

Requires the heat of the stove, where it grows freely, in any light sandy soil, producing offsets rather plentifully. A figure of the species has been published in the Botanical Register, tab. 974.

XXXIII. Phycella corusca.

P. umbella patente multiflora, sepalis æqualibus apice patentibus obtusis, staminibus sterilibus subulatis.

A bulb which was collected by Mr. James M^{c}Rae about Coquimbo, and sent home by him in June 1825, flowered in the stove in September of the same year, and appeared to be so similar to the figure in the Botanical Register, tab. 809,

of Amaryllis ignea (now Phycella ignea), that it was believed to be that species. It was remarkable for having six barren stamens alternating with the fertile ones, under the form of subulate processes, about half the length of the fertile filaments. It having subsequently been stated by Mr. HERBERT in the Botanical Magazine, folio 2687, who possesses and has examined the original plant of Amaryllis ignea, that these processes are very obsolete in that species, it is evident that the bulb sent home by Mr. M'RAE is essentially distinct. I have therefore named it P. corusca. The plant which flowered also produced its seeds, which were thin and flat like those of Amaryllis Reginæ, and similar species.

This is an extremely handsome plant, throwing up from the centre of the narrow leaves a stout scape about a foot in height, which is crowned by a candelabrum-like umbel of long tubular flowers of the most vivid crimson. Should be cultivated in light sandy loam.

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VII. *Account of a Protecting Frame for Fruit Trees on Walls. In a Letter to the Secretary. By Mr.* John Dick, *Gardener to The Right Honourable* William Trotter, *Lord Provost of Edinburgh, at Ballindean in Perthshire.*

Read February 21, 1826.

Sir,

In compliance with your request, I have sent a drawing of my new Protecting Frame for Fruit trees on Walls, which both keeps the fruit when ripe from being destroyed by wasps and flies or birds, and also preserves the blossoms in spring from frost, and so insures a crop of fruit.

As the references to the drawing explain sufficiently all the details of the construction, I need not repeat them here, but will only give directions, first, for using the frame in spring for preserving the blossoms, and afterwards, for its application in summer and autumn for the protection of the ripening fruit.

When the frame is put against the wall, whatever kind of fruit-tree it is destined to cover, it should be placed as close to the wall as possible without crushing the branches. The frame is fixed by iron holdfasts driven into the wall, two at top and twoat the bottom, also by two at each side; these last keep it steady. The cloth screen is then secured in the front of the frame, so that it will run from side to side with ease as may be required. The folding facing at the bottom of the frame is then turned up and fastened. The screen may be drawn open in fine days, but if the weather is frosty, it is better to keep it close, as the cloth is so thin that plenty of

sun and air pass through it, and the confinement consequently will not hurt the trees. The top part of the frame is a little sloped to let the rain run off; and further, this part is of great use in keeping off the hail showers, as well as the snow and heavy rains from falling perpendicularly upon, and hurting either the blossoms or the young fruit when it is formed. The time to take off the frame in spring is when the fruit is of a sufficient size to stand unprotected; this must be left to the judgment of the gardener.

I now proceed to show how the wasps, flies and birds are prevented from injuring the fruit when ripe, by the Frame. It is to be placed over the trees as close as possible without hurting them, in the same way as has been directed to put it over them in spring. A little fine moss, or fogg, is then stuffed in close between the frame and the wall, in such a tight manner that no wasps nor flies can get in between. The time that the screen is required to remain upon the trees at this season is very short, and the trees will not be hurt by the moss or fogg, if it is carefully put in. When the trees have old long spurs, it may sometimes be necessary to cut some of them out, to enable the frame to be fitted close to the wall. When any of the fruit is to be gathered, the screen can be easily shifted from side to side, and although there should be wasps or flies about, they can be all driven out and the screen shut in a very little time. The fruit that falls is received into the little bag at the bottom.

The cloth that is used for the screen is manufactured at Dundee; it is a thin semi-transparent canvas, about thirty six inches broad, made of yarn spun from the best flax, and is exactly of a proper texture; if it were closer, it would

hurt the trees; if thinner, it would not wear. The edges and seams of the screen are bound with tape. The cost of the cloth is five-pence per yard, and that of the tape one halfpenny per yard.

When the frame and screen are taken off the wall, the latter should be placed in a dry room out of the reach of rats and mice, and a little camphor should be sprinkled between its folds to drive away the moths.

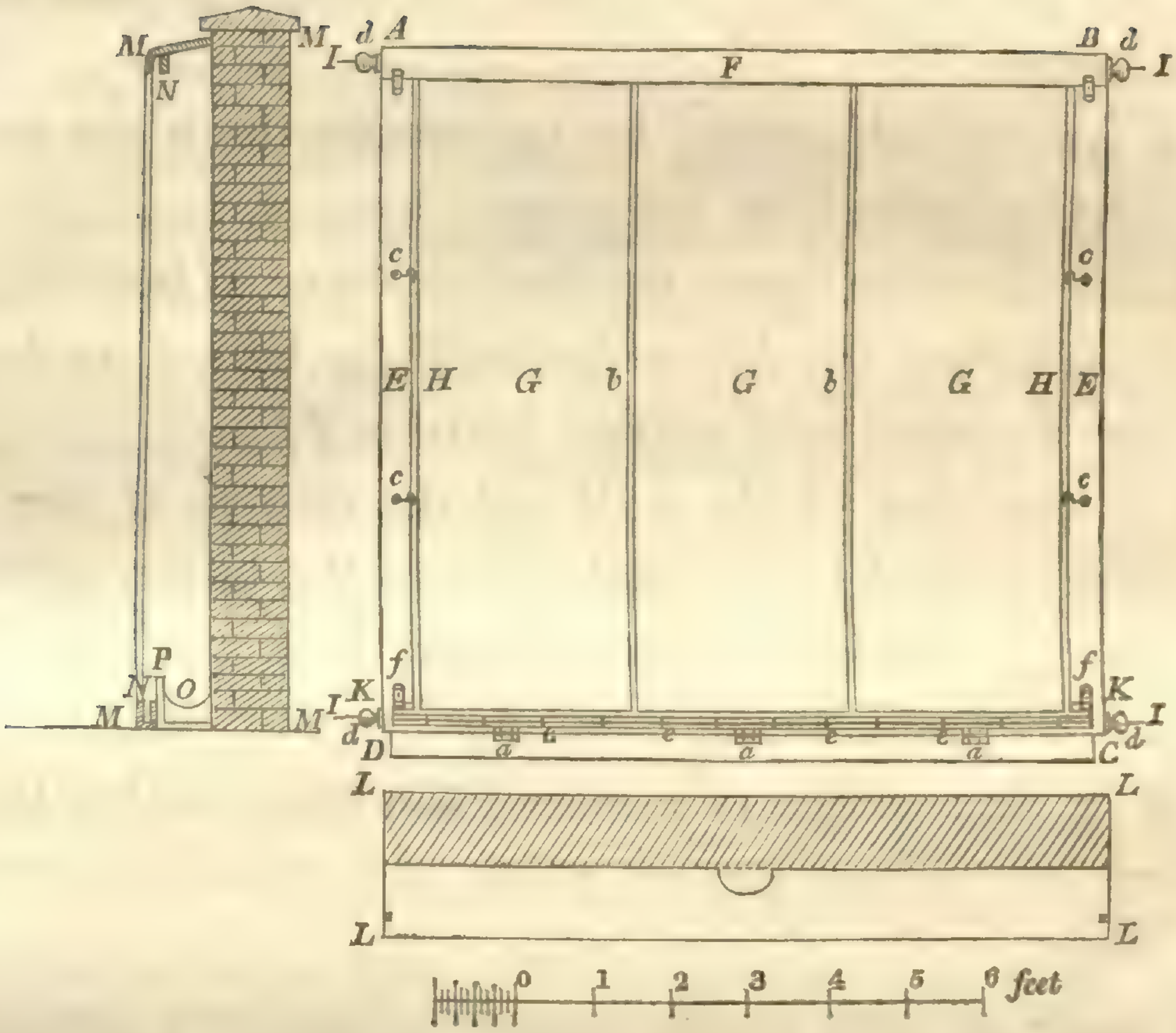
The size of the wire used for the screen to run upon, must depend on the length of the frame, which may vary from nine to eighteen feet, that is from three to six breadths of the cloth. For the shortest length, it may be less than a quarter of an inch in diameter; for the greater length, a slight increase of strength, and consequently of thickness, is required. The wire is always kept straight by means of the screws at its extremities. If the screen is made to exceed three breadths of the cloth, a slight slip of wood may be tacked to each alternate seam, the whole length of the seam perpendicularly; this addition will stiffen the screen, as well as prevent it being much shaken by the wind, without impeding its sliding backwards and forwards.

I am with the utmost respect,

Your most obedient Servant,

JOHN DICK.

Ballindean Garden,
January 4, 1826.



References to the Plan of the Protecting Frame.

A B C D, are the four corners of the wooden frame when joined together and fixed upon the wall.

E E, are wooden facings fixed on the front edge of the sides of the frame, for the reception of the screen within them.

F F, are similar facings on the top and bottom, but moveable on hinges, *a a a*, for the convenience of putting the rings of the screen upon the iron wires I I I I.

G G G, are the breadths of the screen strengthened by slips of tape *b b*, sewed upon the seams.

H H, are two upright pieces of wood (to which the screen is nailed), which slide under the facings E E, and are secured by the hasps, *c c c c*.

I I I I, are the iron wires on which the screen slides by means of rings.

d d d d, are thumb-screws, for tightening the wires and preventing them from relaxing.

e e e e, are the rings upon the bottom wire. When the screen is adjusted, the lower facing F, is folded up to K K, and fastened with square buttons, *f f*.

L L L L, the plan of the wall and the bottom of the frame, with a semicircular hole cut in the latter, sufficiently large to receive the stem of the tree, and thus to permit the frame being fixed close to the wall.

M M M M, the section of a side of the frame and of the wall.

N N, are the top and bottom stops to keep the screen in its place.

O, is a piece of cloth loosely suspended between the wall and the upright stake P, to receive the fruit that falls off the tree. The stake P, is repeated at convenient distances in the frame.

Report made from the Garden of the Horticultural Society on the Utility of Mr. Dick's *Frame for Protecting Fruit-trees on Walls.*

The chief advantage* of this frame is, its protecting ripening fruit from wasps and other insects, that always attack wall-fruit when approaching maturity. This inconvenience is much felt whenever these insects are numerous,

* It is understood that a Medal was awarded by the Caledonian Horticultural Society to Mr. Dick, in June last, in consequence of a favourable report to the Society respecting his Protecting Frame.

and one half, or more, of a crop, especially of Peaches and Nectarines, though ever so plentiful, is usually eaten up, or so much damaged as to render it unfit for table. Few fruits escape the ravages of insects, more or less, while the tender and more delicate are totally destroyed.

The Frame described by Mr. DICK answered perfectly in the last summer in preserving ripening fruit from insects. It was tried on a Red Magdalen Peach tree against a south wall, where other Peach trees were also growing. Those that were growing exposed upon other trees were much disfigured, and many of them were entirely spoiled, while those under the protecting frame were as clean and perfect as forced Peaches under glass usually are, excepting that some were a little marked near the stalk by earwigs, and those insects which harbour in walls; against these, the frame affords no protection. To enable the fruit to arrive at its full flavour, the screen should be withdrawn in the evening, to expose the crop during the night, and for an hour or two in the morning, when the insects are at rest; but in clear and bright weather this is not requisite. The weather being of this character last summer, the fruit under the frame was seldom exposed, and its flavour was in no degree inferior to that of Peaches which were continually open to the full sun. Mr. DICK's screen will also be serviceable in protecting the blossoms of fruit-trees in the spring, though less expensive apparatus answers equally well for that purpose.

Horticultural Society's Garden, Chiswick,
November 20, 1826.

VIII. *On the Esculent Egg Plants.* *By Mr.* ANDREW MATHEWS, *A. L. S.*

Read December 19, 1826.

THE fruit of Solanum esculentum, though but little used in this country, is considered as an esculent of much excellence within the Tropics, as well as in the South of Europe. M. DUNAL informs * us, that about Montpelier it is sown in the beginning of spring, and produces abundance of fruit towards the middle of summer, and continues till the end of October to supply the tables of both the rich and poor. Until the publication of M. DUNAL's History of the Solanums, in 1813, the Esculent Egg Plants were considered as varieties of the Solanum Melongena of LINNÆUS. This name is now referred exclusively to the Ornamental Egg Plants of our stoves, the white variety of which is commonly cultivated as a hot-house annual, and is never applied to culinary purposes. Those which are so used, were placed by M. DUNAL as a separate species under the name of S. esculentum,† of which he makes four varieties. The particular kinds I am now treating of, are referable to the first and second varieties of DUNAL, though I doubt whether all the references and synonyms applied to them by him are strictly correct. The third and fourth varieties, one with spiny black fruit, and the other with perfectly round fruit, are derived only from the

* See DUNAL, Histoire des Solanum, page 102. † Ibid, page 208.

writings of the old Botanists, and are perhaps either distinct species or not in cultivation in the present time.

The Eatable Egg Plants have received a variety of appellations, and are known in various countries by the following names, viz.: in Arabia, *Bedegian*, (RAUWOLF), *Bydendjan*, or *Badingian*, (DUNAL); in Turkey, according to MILLER, *Badinjan*, or according to Dr. WALSH *Palindjam*;* in Spain, *Barenkeena*, (MILLER); in Portugal, *Beringella*, (BROTERO); in Italy, *Melanzana* (Mala insana), (MILLER); and in France, *Mélongène*, (DUNAL); *Mérangène*, (NOISETTE); *Mayenne*, (DUNAL); *Meringeane*, (JARD. POT.); *Verangeane*, (DUNAL); and *Viedaze*, (NOISETTE); but chiefly *Aubergine*. MILLER, in the Eighth Edition of his Dictionary, describes these plants under the generic name of Melongena, but has mixed and confounded the White Egg Plant and its varieties with the edible Purple-fruited kinds; he says they are called *Brown John*, or *Brown Jolly*, in the West Indies. According to BROWNE,† the Brown Jolly, or Bolangena of Jamaica, is perennial, and a rough and prickly plant, and if the same as ours, must be considerably altered in its general character by climate. In the East Indies they are known by the name of *Brinjalls*.

As esculent vegetables, they will be in this country considered more as a matter of curiosity than of general utility. They have already engaged the notice of the Horticultural Society. In the Sixth Volume of the Transactions, page 116, is an account of a method of growing them under frames, communicated in 1822 by Captain RAINIER, who at the same time gave some instructions for preparing them for the table.

* See Horticultural Transactions, Vol. vi. page 53.

† History of Jamaica, page 173.

It is probable that in different countries the ways of dressing them are very various. The first object seems to be to destroy the bitter taste which remains in the fruit if only subjected to a simple process of cookery. The following has been tried, and found to answer perfectly, rendering them not only palatable, but very agreeable.—Split each fruit lengthwise into three pieces; let each piece be scored, well rubbed with salt and set to drain for two or three hours; after which, soak the pieces in water until the salt is extracted. Then pepper, and fry the pieces in butter with crumbs. When served the pieces will appear thin and flat.

The method of growing the Egg Plants, as practised in the Garden of the Horticultural Society in the present year, is sufficiently simple to be worthy the imitation of those who would desire to cultivate them in their gardens.

The seeds were sown early in the spring in pots or pans placed in a hotbed frame; when the young plants were two or three inches high they were transplanted singly into separate pots, and replaced in the frame till they were nine or ten inches in height; they were then turned out of the pots, and planted in the open air in front of walls at a few inches distance from the wall. In a south aspect they succeeded best, but they bore good fruit in a western. When very dry weather occurred, they required occasional watering to prevent the attacks of the red spider, to which they are particularly subject in all situations, but especially under glass.

The following are descriptions of the two varieties cultivated in the Garden of the Horticultural Society, with their synonyms, as far as I have been able to ascertain them. The seeds of both were received from M. Vilmorin, with names quoted on his authority as synonyms.

ROUND PURPLE EGG PLANT.

Solanum esculentum ; *α, baccis oblongo-teretibus, violaceis.* Dunal.
Solanum pomiferum fructu oblongo. Caspar Bauhin.
Melongena ovata. Miller.
Aubergine violette ronde. Vilmorin.
Mélongène rouge à fruit rond. Noisette Manuel du Jardinier.
Mammoth Egg Plant. American Gardens.

This variety grows from two to three feet in height; it is slightly downy and branching, and most generally tinged with purple. The leaves are large, pubescent, oblong, repand, the lobes irregular and rounded; some of them have a few scattered purple spines on the midribs. The flowers are large, and pale purple, the calyx and peduncles being covered with a few purple spines. The fruit is large, obovate, when mature of a fine deep purple, about three inches in diameter at the broadest part, and about four inches long; the end obtuse, and slightly indented in the apex. It occasionally varies in its colour, being sometimes slightly striped or rayed with yellowish-green on purple. It was received from New York with the name of Mammoth Egg Plant.

LONG PURPLE EGG PLANT.

Solanum esculentum ; *β, baccis oblongo-teretibus apice recurvis purpureis, flavis aut cinereis.* Dunal.
Solanum pomiferum fructu recurvo. Caspar Bauhin.
Melongena tereta. Miller.
Melongena incurva. Miller.
Aubergine violette longue. Vilmorin.
Mélongène rouge à fruit long. Noisette Manuel du Jardinier.

This variety grows to the same height as the Round Purple, and is subject to some variations in the colour of its

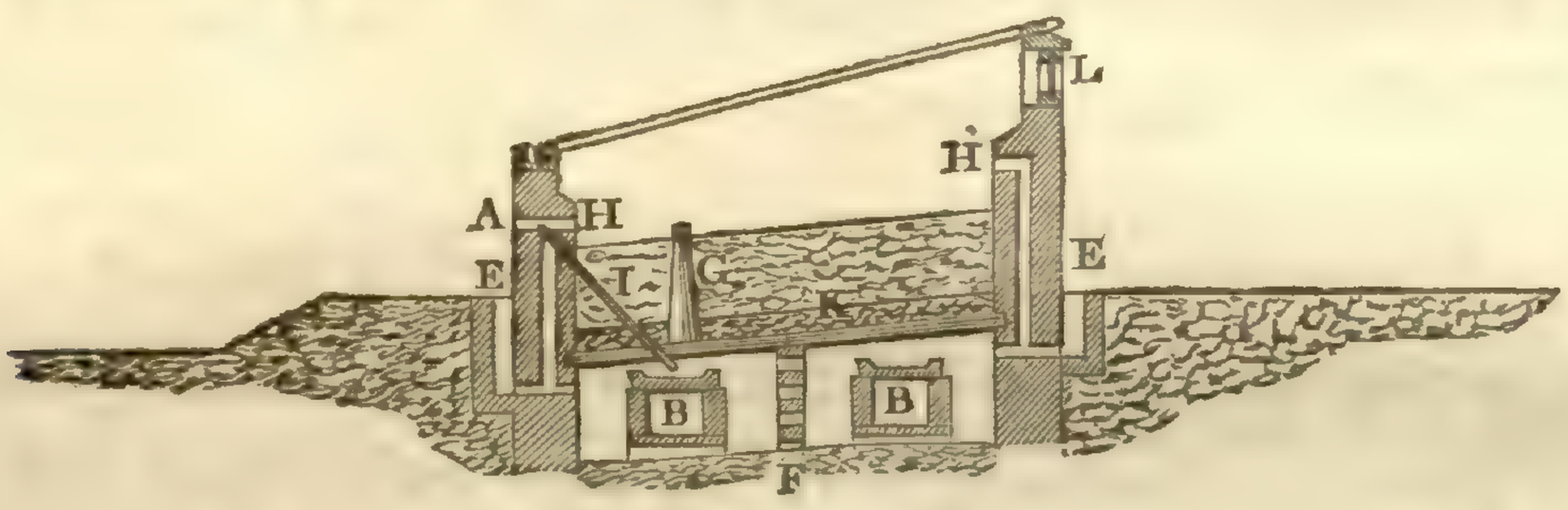
branches and the production of spines; it does not appear to differ materially from that variety either in the form or texture of its leaves. The flowers are also large, and pale purple, with a spiny calyx. The fruit is oblong, somewhat club-shaped, from five to eight inches in length, sometimes straight, but generally slightly bent; when mature, of a deep purple; but it is subject to more differences of colour than the Round kind, being sometimes pale purple slightly striped, and often much variegated with longitudinal yellowish stripes, and is always more deeply coloured on the exposed side. MILLER's two plants, which he calls Melongena tereta and Melongena incurva, seem both referable to this variety, differing in little else than in the straightness or incurvation of the fruit.

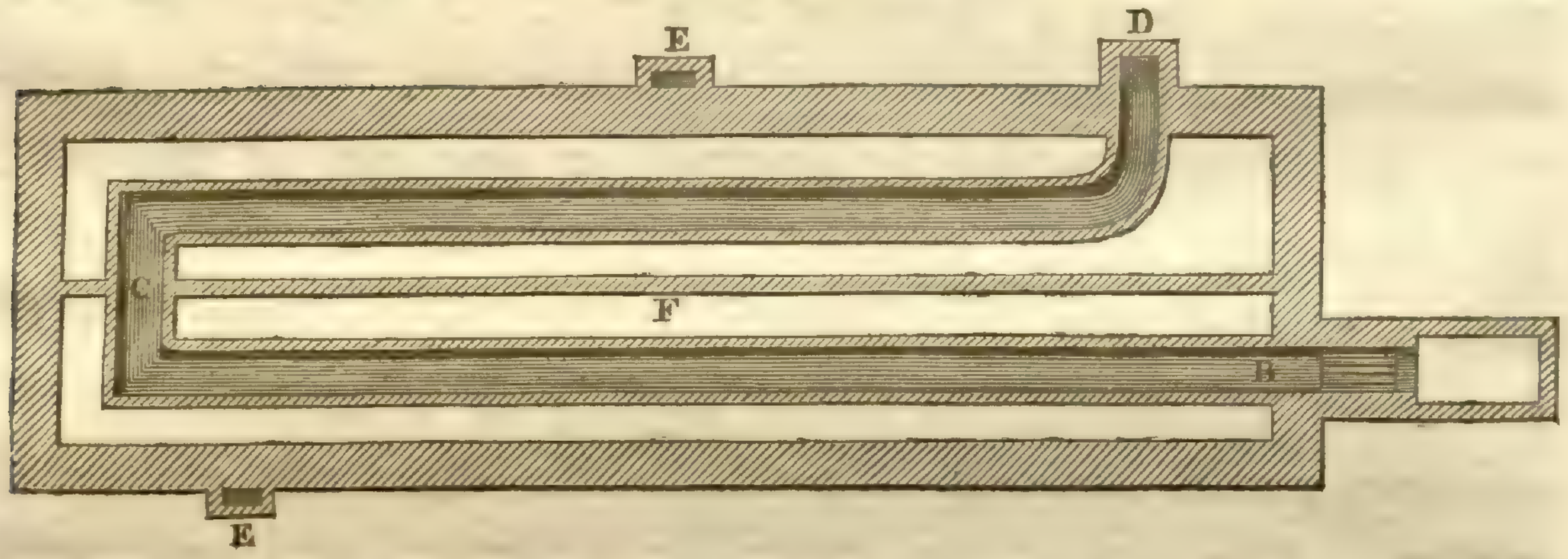
In the East Indies, other varieties than these two are said to exist, in proof of which, eight pacquets of seeds of Brinjalls were received by the Society from JAMES MORLEY, Esq. of Bombay, in 1821, and were labelled as so many different varieties. These were all sown after they were received, and have been subsequently tried, but though plants of each were raised, exhibiting some appearances of variation in the foliage, yet fruit was obtained from only two of them, and they agreed with the varieties above described. It is supposed, from the difficulty which has occurred in getting produce from the others, that they require the temperature of a tropical country to bring them to that state in which they would be useful, and that perhaps the two kinds I have described are all that can be expected to arrive at perfection with us.

IX. *Notices of Communications to the Horticultural Society, between January* 1, 1824, *and January* 1, 1825, *of which separate Accounts have not been published in the Transactions. Extracted from the Minute Books and Papers of the Society.*

At the Meeting on the 6th of January, a plan of a Pine Pit, erected in the Garden of William Forman, Esq. at Pennydarron Place, in Glamorganshire, was exhibited; it is found to answer all the purposes for which it was designed. The pit is heated from a chamber below it. A flue of the usual construction is carried through the chamber. This flue passes from the furnace, which is situated at one end of the pit in the front part of the chamber, and, turning at the opposite end, is carried into the chimney in the back of the pit; the flue rises gradually, but more rapidly as it approaches the chimney; still however the whole rise does not exceed six inches. The top of the chamber is formed with oak beams three inches wide by one and a half thick, placed at intervals of three inches, and supported in the middle by a wall of open brick work; the beams are covered with a course of turf, on which the tan is placed for the reception of the Pine plants. The warmed air is conveyed into the upper part of the pit by means of small apertures built in the walls, at four inches and a half apart, both in the back and front of the pit, also through iron pipes, resting on the beams and passing through the tan. The ventilation is effected in front by air holes (stopped when necessary by plugs) passing through the wall, and at the back

by sliding shutters at the top of the wall. The flue is covered at top with hollow tiles, and water is poured upon the front part of it by means of an iron pipe passing from the outside, for the purpose of raising steam within the chamber and pit. The following ground plan and section of the pit will illustrate the above description.





Explanation of the Figures.

A, Air holes for ventilation, passing through the front wall, three inches in diameter, and three feet apart.

B, Flue rising gradually to the turn C, and then proceeding to the chimney D.

E, Damper at back and front, to be opened when necessary, for the escape of the heated air from the chamber.

F, Wall to support the oak beams, built of open chequered brick-work, to allow of the free passage of the air.

G, Iron tubes, resting on the beams, to carry the warm air from the chamber below into the upper part of the pit.

H, Holes in the wall, four inches and a half apart, also for the conveyance of the heated air from the chamber into the upper part of the pit.

I, Iron pipe, an inch in diameter, for the conveyance of water into the hollow tiles at the top of the front flue.

K, A course of turf laid upon the wooden beams.

L, Back ventilators, covered by sliding shutters six inches high by eight inches long.

Mr. William Buck sent, on the 7th of January, from Elford, specimens of his Scarlet Rhubarb, which is also called Buck's Rhubarb; it had been forced in the following manner. The roots taken up as perfect as possible, leaving the earth which adheres to them still attached, are placed in a bed of decayed tan, or in boxes or pots filled with the same, in the Mushroom-house, which, by the aid of a flue, is kept at a temperature of from 45° to 55°. Tan is preferred to mould, because it receives water more freely when given to the plants. After the forcing is finished, the roots are kept under cover of long litter, or manure, till warm weather in April, when they are divided by a sharp knife, and planted in a north border, or in the open ground; in the following autumn the strongest are fit to be forced again in the ensuing winter, and the weakest are replanted for another season. It is found that peeling the stalks of this kind of Rhubarb, before it is put into a tart, both destroys the colour and deteriorates the flavour.

George Tollet, Esq., in a letter to the Secretary, from Betley Hall, in Staffordshire, dated the 14th of February, describes the success of his gardener in preserving Apples, laid in hods, in the manner of Potatoes. Some Apples, which had been thus treated, were sent to the Society at this period in as fresh a state as if newly gathered from the tree. This plan of preserving Apples must be very useful to cottagers and others who have not the advantage of a fruit-room for the protection of the produce of their gardens and orchards during winter. The Apples should be of hardy and keeping sorts, and not more than four or five bushels should be put into one hod. It is requisite to place straw at the bottom and sides, and also to cover the top of the heap of Apples with straw, so as entirely to separate them from the earth; this is not always done with Potatoes.

A communication was read on the 6th of April from Thomas Bond, Esq., of East Looe, in Cornwall, detailing his mode of treating Strawberries in beds. The runners are not cut off, but are confined to the bed, those which pass over the sides being turned back on the beds. In the latter part of autumn, before the frost sets in, the earth from the alleys between the beds, or other earth from the garden, is thrown over the beds to the depth of two or three inches, so as entirely to cover the plants and the runners. In the spring, the whole shoot through the covering with great vigour, producing very strong foliage, and in due season, abundance of large and finely-flavoured fruit. Before this practice was adopted, very little fruit was obtained. The soil is light, and the beds are occasionally watered when the plants are in blossom. The leaves being

abundant, hide the beds and fruit from the sun, and prevent evaporation and the growth of weeds. The fruit-stalks grow eight or ten inches in height, and as the berries at their extremities increase in size and weight, the stalks fall under the leaves, and are consequently protected from showers beating the earth on them, which is often the case when plants stand in single rows. The first year of this plan is less productive than succeeding ones; the Wood and Alpine Strawberries do not however succeed under such treatment.

At the Meeting on the 15th of June, WILLIAM WALCOT, Esq. exhibited Wicker Protectors for tender trees and shrubs in winter, and for shading seedlings and newly removed plants in summer. These were of various forms and sizes, and, having been tried subsequently in the Society's Garden, have been found to answer their purpose perfectly. They are made of osier-work of the coarsest description, and, in figure, are accommodated to the plant for which they are destined; or if small, and not prepared with any specific object, of an hemispherical or conical form. They are either made entire, or in two halves which are readily tied together. The points of the ribs of the work are made to project a few inches at the bottom, and thus serve as feet by which the Protectors are fixed in the earth.

JOHN WEDGEWOOD, Esq., in a Letter to the Secretary, dated the 22nd of June, stated the success he had experienced in the preceding year in making a plantation of Celery, late in the year, from the seedling plants which had remained in the seed-bed till they had grown to considerable size. The plants

thus removed not only took well, but had the advantage over those planted when very young, as is customary, in growing stronger as well as being sooner fit for use. If the success of this experiment should be confirmed by experience, it will relieve the gardener from much labour and trouble in attention to the planting his trenches of Celery at an early period.

At the Meeting on the 3rd of August, a Communication from WILLIAM COTTON, Esq., of Wellwood House, near Leytonstone, was read, detailing the effects of an experiment in washing an old garden wall with seal oil, with which Anticorrosion paint* was mixed. He had first used the mixture for the purpose of colouring the bricks of a new wall near a flower garden, and having an old wall contiguous, on which the trees had been blighted, and nearly unproductive for several years, he washed it with the oil, mixing a small quantity of the paint with it. In the seasons which have succeeded the operation, the trees on the old wall so coloured have borne good fruit, and made strong wood, whilst those on a much better wall in another part of his garden, having the same aspect, which had not been painted, were much injured by blight. This wall he has since washed over with cod oil and a small quantity of Anticorrosion paint. The cod oil was used as being less offensive in smell than the seal oil; the effect has been considerable, but the cod oil does not appear to be so great a preservative against blight.

* This material is sold by Mr. ROGER JONES, Robert Street, Hoxton; its composition is a secret, but it is stated to be made of highly vitrified materials. It is prepared in powder of three different colours, stone, lead, and red, and is principally applied to covering fences, and out-door buildings.

At the Meeting on the 7th of September, a Paper by Mr. JOHN MEARNS, Gardener to WILLIAM HANBURY, Esq., at Shobden Court in Herefordshire, was read, describing his mode of obtaining a strong autumnal crop of fruit of the Red and White Antwerp Raspberries. In May he removes the young fruit-bearing shoots from the canes, leaving in some cases one or two eyes, in others cutting them clean off. Under either plan, they soon shew an abundance of vigorous shoots, frequently three or four from each eye, which produce plenty of blossoms in the beginning of July, and on these a good crop of fine Raspberries is borne in August, when all the regular produce on the plants not thus treated is consumed.

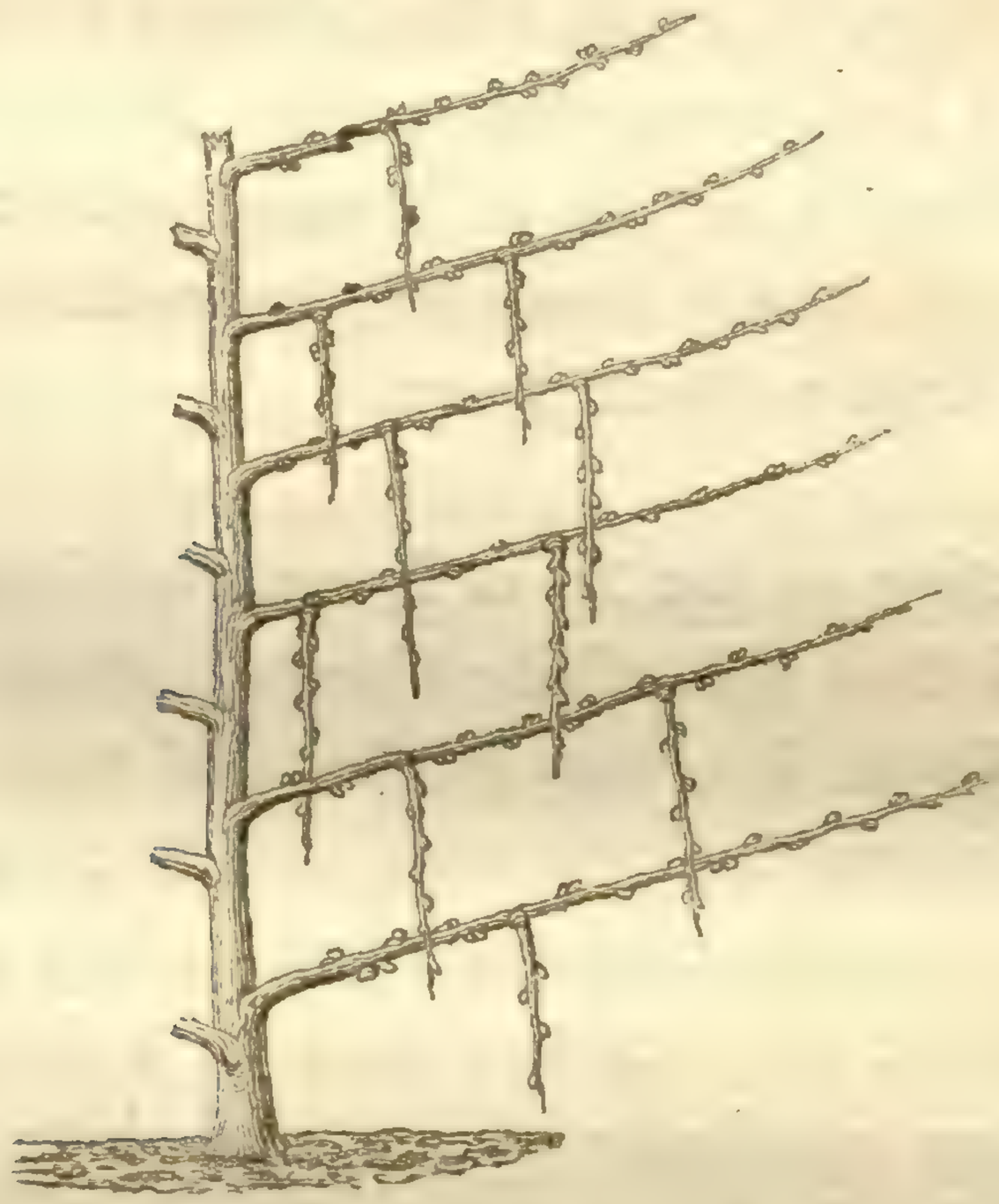
Mr. ELIAS HILDYARD, Gardener to Sir THOMAS FRANKLAND, at Thirkleby, in Yorkshire, in a Communication to the Society, read on the 21st of September, stated, that having continually lost his crop of Onions in consequence of their being attacked by the grub when half grown, he had tried the effect of trenching his beds, and thus had destroyed or removed his enemy. The soil of the garden is very strong; he trenched it in winter, digging in manure at the same time, and left it exposed to the frost in a rough state till the time of sowing. It was then raked without digging, and the Onion seed was sown in drills at eight inches apart. The crops obtained by this practice are not only uninjured, but of superior size, and have never failed. He finds the plan answers equally well for Garlick and Shallots; the latter he always plants in preference in November; they then grow larger, and are more productive. He sows his Onions in the middle of

February, if the ground be in a fit state to work properly, for the earliest sown Onions are always the largest.

Sir GEORGE MACKENZIE, in a Letter to the Secretary, dated at Coul, in Ross-shire, on the 23d September, observes, that those sorts of Pears, which, when allowed to ripen on the trees, do not keep long, or soon become rotten within, though they appear sound outwardly, are much more useful for the table if gathered before they are ripe; they then remain longer fit for use, and do not decay internally. The Pears particularly referred to are the Jargonelle, Longueville, Windsor and Green Pear of Yair.

At the Meeting of the Society on the 5th October, a Communication from the Reverend JOHN FISHER, of Wavendon, in Buckinghamshire, was read:—it described his method of treating a Swan's Egg Pear Tree, which had failed to be productive; the tree is trained against the gable end of a building. The branches of the tree which are luxuriant and healthy, were trained horizontally, but produced few spurs or blossoms, though some of them had been ringed. Some of the upright shoots from the branches were in the summer carefully broken near the branch, but not separated, and trained downwards; the full flow of the sap being thus interrupted. Before the winter, the broken parts had been formed into knobs, or knees, and thus were firmly attached to the tree. In the ensuing spring, these produced a full quantity of blossoms, which set well, and afforded an abundant crop of Pears, the pendent shoots being so full as to

resemble ropes of Onions attached to the branches. The annexed sketch represents the appearance of part of the tree. In a subsequent Communication Mr. FISHER reports the production of a very full crop of Pears in 1826; and adds, that it is better to twist and break down the young shoots late in the autumn, when the wood has become tough, after the sap has retreated. He states that the pendent branches continue perfectly healthy.



Mr. WILLIAM MOWBRAY, Gardener to the Earl of MOUNTNORRIS, at Arley Hall, in a Letter to the Secretary, dated the 29th of October, gave an account of several successful trials he had made in obtaining fruit of different species of Passifloras. Some of these rarely, if ever, produce fruit, if left to themselves, or even if set with their own pollen; but Mr. MOWBRAY had found that they would bear freely if the pollen of other species was applied to their blossoms. By this means he had in the preceding summer obtained fruits

from P. racemosa and P. alata, by using to each the pollen of the other. The fruit of P. racemosa is elliptical, about three inches long, yellowish-green, and disagreeable both to the taste and smell. The fruit of P. alata is of good size, though not so large as that of P. quadrangularis, of a yellow colour and pleasant flavour, being both sweet and rich. P. alata is much hardier than P. quadrangularis, and thrives well when the latter will not live; it requires to have its roots kept moist, and grows freely when planted in the earth in the back wall of a hot-house, and trained up the wall. As its fruit has equal merit to that of P. quadrangularis, the facility of its culture will enable those who cannot obtain the one, to add the other fruit to their desserts.

At the Meeting on the 2d of November, JAMES WEBSTER, Esq. exhibited Red and White Currants from his garden at Westham in Essex, in a very perfect and fresh state. These had been preserved on the tree, which had been covered with bunting from the time the bunches had ripened. This covering is found to keep the fruit in a better state than mats. The free admission of light and air to the tree seems to be beneficial. It is necessary after the bunting has been fixed to open it at the bottom occasionally, in order to remove the leaves which drop from the bunches. The berries should be well ripened before the bunting is fixed, otherwise they will shrink, instead of remaining plump and full.

X. *Report on the Instruments employed in, and on the Plan of a Journal of, Meteorological Observations kept in the Garden of the Horticultural Society at Chiswick.*

Read February 7, 1826.

The Register of Meteorological Observations for the year 1825, of which an Abstract* has been laid before the Society, was carried on with such instruments as were quickly attainable, after the determination of the Committee on the subject had been made. Considerable pains were, however, taken to procure for the next year more perfect ones, under the best advice and assistance which could be obtained; the object being to give the Register such a character for accuracy, as would render it not only useful to the purposes of Horticulture, but for the deeper researches of those men of science, whose attention it was known were at the time particularly directed to the subject.

The following account and description of the Instruments used for the observations of the year 1826, has been prepared, and will, it is presumed, be found generally acceptable, and especially so to those who are engaged in similar pursuits.

The Barometer was made by Mr. John Newman of Regent-street, and the greatest care was employed in its construction. The internal diameter of the tube is 0.45 inch, and the capacity of the cistern has been so adjusted, that a rise or fall of 1 inch in the former, makes a difference of 0.01 inch

* This was subsequently published in the Transactions, see Vol. vi. page 398.

in the level of the mercury in the latter; thus the neutral point, *i. e.* the level from which the height of the mercurial column was first measured being known, the correction for capacities is readily made, by subtracting or adding one hundredth of the difference, accordingly as the mercury has risen above or fallen below this point. The tube is armed at the bottom with a platinum cap perforated with a hole of one eighth of an inch in diameter, which is sufficiently large to admit of the mercury flowing in and out with perfect freedom. This platinum guard has been well wetted with mercury, according to the suggestion of Mr. Daniell, in the 39th Number* of the Journal of the Royal Institution, and is intended to prevent, by the complete contact which it insures, the gradual insinuation of air and moisture, which there is reason to suppose takes place in all barometers, from the want of affinity between the glass and the metal.

The mercury was very carefully boiled in the tube; but notwithstanding the utmost attention was bestowed upon this very difficult process, some small air-bubbles made their appearance at the top of the column, immediately after the instrument was fixed in its place. Few people can be aware, except thòse who have tried the experiment, of the difficulty of boiling in a glass tube such a weight of mercury as that contained in this barometer; a difficulty which will always render it advisable to have recourse to tubes of small diameter, except in standard instruments, in which it is desirable to reduce the capillary action to the smallest possible amount. This correction does not exceed 0.009 inch in the present instance, but is constantly applied to the observations.

* Journal of Science, &c. for October, 1825, Vol. xx. page 88.

The cistern, which is turned in mahogany, is lined with iron. The tube dips 1.1 inch below the surface of the mercury, and a thermometer is inserted in it to mark it's temperature. There is also a float, which corresponds with a fixed mark when the column stands at the neutral point. The observations are made by means of a vernier, carrying an index both before and behind the tube, the coincidence of which with the highest part of the surface of the mercury, which is always more or less convex, is easily ascertained. The proper correction is always applied for the varying temperature of the mercurial column, and the entry in the register is the actual pressure of the atmosphere at the station, as it would be measured by a column of mercury of the temperature of 32° of Fahrenheit.

The barometer is firmly fixed against the wall of an apartment, at the back of the small Green-house, in the Experimental Garden, which is otherwise used as a seed-room; the window and door of the room open to the north, and there is no fire-place in it. Its position is nearly 14 feet above the mean level of high water in the Thames, at Chiswick.

The observations with the barometer are made at three periods of the day, viz. morning, noon, and night.

A Daniell's Hygrometer is used for ascertaining the state of the vapour in the atmosphere. The naked ball upon which the dew is deposited, is formed of black glass, and the observations are made three times in the day, at the same periods as those with the barometer, with every precaution recommended by Mr. Daniell in his Meteorological Essays. The tension of the vapour, and the moisture of the atmosphere, are calculated from the dew-point, from the tables in that work.

The Register Thermometers are of RUTHERFORD's construction, and made by Mr. NEWMAN. Those by which the maximum and minimum of the temperature of the air in the shade are ascertained, are placed in an open spot in the Arboretum, skreened from the rays of the sun, and sheltered from terrestrial radiation by a kind of umbrella of oiled cloth; they are attached to the northern side of the post which supports the umbrella, and stand four feet from the ground. That by which the maximum of heat is ascertained, is filled with mercury; the one applied to registering the minimum of heat, is a spirit thermometer.

In addition to these, two other register thermometers of the same construction are used. The first is of mercury, and the ball is covered with black wool. It is placed within four feet of a garden wall, fronting the south, about two inches from a bed of garden mould. It registers the greatest degree of heat under the influence of the sun. The second is of spirit; its ball is also covered with black wool, and is fixed in the focus of a parabolic metallic speculum, and exposed to the full aspect of the sky. It registers the maximum degree of cold arising from radiation in such a situation. It is placed in the Arboretum, near the first described thermometer.

The Rain-gauge is made according to Mr. HOWARD's directions, in his work upon the climate of London; it stands upon the level of the ground in the Experimental Garden. The quantity of rain is registered daily.

The direction of the wind is noted by a vane of the usual construction.

The plan pursued in recording the Observations, is similar to that proposed by Mr. DANIELL, in his Essays before referred to.

The objects to be recorded, being

Firstly. The state of the barometer, hygrometer, and weather, at the three periods of observation before mentioned.

Secondly. The maximum and minimum of temperature in each day, distinguishing the temperature of radiation from the common temperature of the air.

Thirdly. The direction and force of the wind.

Fourthly. The amount of rain.

Fifthly. General Remarks on the state of the weather during each month, with the Means of all the daily observations, shewing the

Mean pressure.

Mean temperature.

Mean dew-point.

Mean force of vapour.

Mean degree of dryness.

Mean degree of moisture.

The least observed degree of moisture.

The maximum and minimum of temperature, both of the atmosphere and of radiation.

The direction of the wind, shewing the number of days it blows from particular quarters.

XI. *Journal of Meteorological Observations, made in the Garden of the Horticultural Society at Chiswick, during the year* 1826. *By Mr.* William Beattie Booth, *A.L.S.*

Read February 20, 1827.

The following Meteorological Journal, is a continuation of that of which an Abstract was published in the sixth volume of the Society's Transactions, page 398. It embraces the whole year 1826. Having been directed by the Committee, as part of my duty as Principal Clerk in the Garden, to attend to these matters, the observations have been made entirely by myself. The Report containing the description of the instruments used in, and the general outline of the plan of the observations, has been already laid before the Society, and is printed immediately preceding this Communication.

The observations were made at the three different periods of the day, as stated in the Report just referred to. The first, or morning observation, was taken at six o'clock in the morning in summer, and at day-break in winter; the second, near mid-day, that is, between noon and one o'clock P.M.; and the third, usually about 9, or between 9 and 10 o'clock at night, but not later. For each of these periods, it will be seen there are five separate columns allotted. The first on the left-hand, contains the true height of the Barometer, corrections having been made at each observation, for the difference of temperature of the mercury, as well as for the capacity of the cistern and capillary action; the second

column shews the degrees of temperature of the atmosphere, as exhibited by the external Thermometer attached to the Hygrometer; the third, that of the dew-point; and the fourth, the difference between the temperature and the dew-point, or the degree of dryness actually existing as expressed by the thermometric scale. The fifth column exhibits the state of the weather at each period of observation.

The right hand pages contain the extremes of temperature, as well as the direction and force of the wind, and the amount of rain, with a few general remarks upon the state of the weather during each month, and the means deduced from the three daily observations, as well as an abstract of the number of days in which the wind blew from the eight chief points of the compass, or approximating thereto. The first column on the left, shews the maximum temperature in the shade, obtained by a mercurial Thermometer, placed as stated in the Report, four feet from the ground, in an open and airy situation. The second is the minimum temperature, obtained in the same place with a spirit Thermometer. The third column is the maximum temperature in the sun's rays, obtained by a mercurial Thermometer placed about two inches from the ground; and the fourth column is the degree of terrestrial radiation, as shewn by the spirit Thermometer used for that purpose; these Thermometers being of course all self-registering.

JANUARY.

1826.		Morning.					Noon.					Night.				
	Days.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.
☾ S.	1	29.816	36	36	—	Wet	29.810	45	44	1	Cloudy	29.808	44	44	—	Cloudy
M.	2	—.857	40	39	1	Fine	—.864	42	36	6	Fine	—.895	32	31	1	Frosty
Tu.	3	—.899	32	31	1	Frosty	—.891	37	36	1	Cold	—.927	33	32	1	Ditto
W.	4	—.957	35	34	1	Ditto	—.941	37	36	1	Cold & Cloudy	—.953	35	34	1	Cold
Th.	5	—.937	34	32	2	Cold	—.911	35	35	—	Wet	—.866	36	36	—	Wet
F.	6	—.703	35	35	—	Wet	—.753	39	39	—	Ditto	—.802	39	39	—	Ditto
S.	7	— 856	37	37	—	Cloudy	—.868	36	34	2	Cloudy	—.931	33	31	2	Cloudy
⊕ S.	8	—.981	32	29	3	Frosty	—.992	33	30	3	Cold & Frosty	30.058	32	29	3	Hard Frost
M.	9	30.069	25	18	7	Ditto	30.056	32	15	17	Ditto	—.006	25	20	5	Ditto
T.	10	29.874	22	20	2	Ditto	29.794	31	20	11	Fine	29.725	32	27	5	Cloudy
W.	11	—.499	30	29	1	Some Snow	—.763	33	32	1	Cloudy	—.900	25	24	1	Hard Frost
Th.	12	—.950	24	22	2	Clear	—.828	30	25	5	Sunny	—.887	22	18	4	Ditto
F.	13	—.977	17	14	3	Ditto	30.006	28	21	7	Ditto	30.079	19	15	4	Ditto
S.	14	30.123	15	11	4	Ditto	—.004	28	23	5	Ditto	—.145	19	14	5	Ditto
S.	15	—.210	15	13	2	Foggy	—.340	23	23	—	Foggy	—.428	18	13	5	Ditto
☽ M.	16	—.555	15	15	—	Ditto	—.565	24	20	4	Ditto	—.604	18	15	3	Ditto
T.	17	—.610	19	17	2	Frosty	—.650	34	28	6	Fine	—.736	25	25	—	Foggy
W.	18	—.555	30	28	2	Clear	—.485	38	32	6	Ditto	—.307	38	37	1	Cloudy
Th.	19	—.286	40	38	2	Fine	—.158	43	40	3	Ditto	—.188	36	35	1	Ditto
F.	20	—.256	38	37	1	Ditto	—.252	41	38	3	Cloudy	—.294	36	36	—	Ditto
S.	21	—.242	35	34	1	Cloudy	—.196	41	41	—	Wet	—.198	38	38	—	Foggy
S.	22	—.283	37	37	—	Foggy	—.288	38	38	—	Foggy	—.252	35	35	—	Ditto
M.	23	—.230	32	32	—	Ditto	— 236	40	40	—	Ditto	—.368	38	38	—	Clear
○ T.	24	—.465	35	35	—	Dense Fog	—.458	36	36	—	Dense Fog	—.468	32	32	—	Foggy
W.	25	—.394	34	34	—	Ditto	—.375	36	35	1	Cloudy	—.367	32	32	—	Cloudy
Th.	26	—.364	34	32	2	Cloudy	—.368	36	33	3	Ditto	—.350	30	28	2	Frosty
F.	27	—.328	25	23	2	Clear	—.313	35	32	3	Sunny	—.319	32	31	1	Cloudy
S.	28	—.316	33	32	1	Ditto	—.302	40	35	5	Ditto	—.236	29	27	2	Clear
S.	29	—.121	29	25	4	Ditto	—.110	44	40	4	Ditto	29.994	36	36	—	Cloudy
☾ M.	30	29.862	40	38	2	Fine	29.794	46	45	1	Fine	29.774	45	43	2	Ditto
T.	31	—.798	45	44	1	Ditto	—.804	48	46	2	Cloudy	—.860	43	42	1	Ditto
		30.105	30.6	29.1	1.5		30.105	36	33.5	3.5		30.120	31.8	30.2	1.6	

JANUARY.

Days.	Temperature.				Wind.		Rain.	Remarks.
	Max.	Min.	Sun.	Rad.	Direction.	Force.	In. Pts.	
1	45	36	44	35	S.E.	Brisk	.10	The beginning of this month was cold, with brisk Easterly winds.
2	43	30	54	24	S.W.	Little		
3	38	32	47	28	E.	Brisk		On the 8th a very sharp frost commenced, and the air, as shewn by the hygrometer, was extremely dry during the 9th and 10th. The barometer was also unusually high for the season.
4	37	32	37	32	——	Ditto		
5	35	35	35	35	——	Ditto	·06	
6	39	36	39	35	——	Ditto	·03	
7	38	32	38	25	——	Ditto		On the 19th a thaw commenced, and the latter part of the month was very favourable.
8	33	25	33	15	——	Ditto		
9	32	22	32	13	S.E	Little		The depth of the frost in the ground on the 18th was ..... 11 inches.
10	32	28	55	23	N.W.	Ditto		Thickness of the ice ..... 8 ditto.
11	35	17	48	12	N.	Ditto		
12	30	17	50	11	N.W.	Ditto		Mean Pressure..... 30.110 inches.
13	32	14	52	6	S.W.	Ditto		—— Temperature ..... 32°.8
14	30	13	40	— 3	N.W.	Ditto		—— Dew Point ..... 31°.1
15	24	—11	41	3	N.	Ditto		—— Force of Vapour ..... 0.208 inch.
16	24	15	42	5	E.	Ditto		—— Degree of Dryness ..... 1°.7
17	35	23	49	13	S.E.	Ditto		—— Degree of Moisture..... 963°
18	39	37	47	35	S.W.	Ditto		Least observed degree of Moisture..... 550°
19	44	35	45	30	W.	Ditto		Maximum Temperature in Shade..... 48°
20	41	34	44	29	S.W.	Ditto		Minimum ditto..... 11°
21	41	30	41	22	N.W.	Ditto	·03	Maximum Temperature in the Sun..... 63°
22	38	30	38	25	S.W.	Ditto		Minimum of Terrestrial Radiation..... 3°
23	41	32	41	26	S.E.	Ditto	·05	
24	36	32	36	28	——	Ditto		**Winds.**
25	36	32	36	29	——	Ditto		
26	37	25	37	15	N.E.	Ditto		North.....3 days. | N. East.....2 days.
27	37	28	62	22	N.	Ditto		East.....7 | S. East.....8
28	41	26	54	20	N.E.	Ditto		South.....1 | S. West.....5
29	45	35	+63	28	S.E.	Ditto		West.....1 | N. West.....4
30	47	42	54	33	——	Brisk		31 days.
31	+48	40	49	32	S.	Little		
	37.1	28.5	44.6	22.3			0.27	Amount of Rain..... 0.27 inch.

FEBRUARY.

1826.		Morning.					Noon.					Night.				
	Days.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.
W.	1	29.907	43	43	—	Foggy	29.881	46	46	—	Slight Rain	29.860	43	42	1	Cloudy
Th.	2	—.911	47	46	1	Fine	—.862	50	45	5	Very Fine	—.776	48	46	2	Ditto
F.	3	—.760	48	47	1	Ditto	—.756	52	52	—	Showery	—.759	48	47	1	Showery
S.	4	—.951	47	46	1	Cloudy	—.976	51	47	4	Dull	—.955	45	44	1	Cloudy
S.	5	—.949	44	42	2	Fine	—.937	50	46	4	Cloudy	—.834	48	48	—	Wet
M.	6	—.598	50	50	—	Showery	—.604	52	52	—	Showery	—.693	48	45	3	Clear
⊕ T.	7	30.104	43	40	3	Very Fine	30.187	50	46	4	Very Fine	30.399	35	31	4	Ditto
W.	8	—.461	32	31	1	Foggy	—.459	48	44	4	Ditto	—.395	30	29	1	Ditto
Th.	9	—.349	32	32	—	Ditto	—.336	43	40	3	Sunny	—.308	29	29	—	Foggy
F.	10	—.277	32	32	—	Ditto	—.292	40	40	—	Foggy	—.216	34	34	—	Ditto
S	11	—.224	37	36	1	Cloudy	—.180	41	35	6	Very Fine	—.145	35	33	2	Clear
S.	12	—.129	47	45	2	Fine	—.138	48	48	—	Slight Showers	—.248	36	36	—	Ditto
M.	13	—.234	42	42	—	Foggy	—.193	51	42	9	Very Fine	—.014	41	41	—	Ditto
T.	14	—.007	45	45	—	Rainy.	—.010	47	46	1	Overcast	—.057	47	47	—	Slight Rain
☽ W.	15	—.023	46	46	—	Ditto	29.978	48	44	4	Sunny	29.888	47	45	2	Clear
Th.	16	29.801	46	46	—	Ditto	—.788	52	49	3	Ditto	—.751	45	45	—	Ditto
F.	17	—.418	47	47	—	Ditto	—.426	51	47	4	Ditto	—.498	36	36	—	Ditto
S.	18	—.804	38	38	—	Ditto	—.828	48	41	7	Ditto	—.943	38	38	—	Ditto
S.	19	—.587	39	38	1	Stormy	—.595	50	50	—	Cloudy	—.604	49	49	—	Wet & Stormy
M.	20	—.984	45	40	5	Ditto	30.013	49	37	12	Sunny	30.123	40	40	—	Ditto
T.	21	30.334	37	32	5	Cloudy	—.341	49	39	10	Cloudy	—.230	47	47	—	Ditto
○ W.	22	—.187	49	49	—	Wet	—.140	50	49	1	Showery	—.010	46	44	2	Clear
Th.	23	29.987	45	45	—	Ditto	29.956	44	44	—	Ditto	—.007	36	34	2	Ditto
F.	24	30.210	33	30	3	Fine	30.238	44	35	9	Very Fine	—.187	43	43	—	Heavy Rain
S.	25	—.116	49	47	2	Cloudy	—.147	56	52	4	Fine	—.248	40	39	1	Cold
S.	26	—.431	38	36	2	Fine	—.497	49	41	8	Ditto	—.500	41	40	1	Cloudy
M.	27	—.468	43	42	1	Cloudy	—.336	50	43	7	Cloudy	—.159	47	47	—	Ditto
T.	28	—.288	45	44	1	Fine	—.250	56	48	8	Ditto	—.239	50	49	1	Ditto
		30.050	42.3	41.2	1.1		30.044	48.7	44.6	4.1		30.133	41.85	41	.85	

FEBRUARY.

Days.	Temperature.				Wind.		Rain.	
	Max.	Min.	Sun.	Rad.	Direction.	Force.	In. Pts.	Remarks.
1	46	42	47	36	SW	Little		
2	52	46	64	40	——	Ditto		This month was upon the whole very unsettled, but
3	52	47	52	32	W	Brisk	.08	mild for the season; the mornings were usually foggy and
4	50	40	52	33	S	Ditto		dull, and only a few days had clear sunshine. About the
5	50	43	59	40	SW	Ditto	.16	middle and towards the latter part, a considerable quan-
6	52	42	54	38	S	Strong	.06	tity of rain fell; on the 19th, 20th, and 21st, the wind was
7	51	—26	65	—19	W	Brisk		very boisterous at night, and on the 24th in the afternoon
8	49	29	62	22	S	Little		some thunder was heard.
9	46	28	64	20	SW	Ditto		
10	40	35	43	29	S	Ditto		Mean Pressure..... 30.075 inches.
11	43	32	55	28	——	Ditto		—— Temperature..... 44°.28
12	50	35	53	28	——	Ditto	.03	—— Dew Point..... 42°.20
13	50	41	65	32	——	Brisk		—— Degree of Dryness..... 2°.08
14	47	45	47	42	——	Little	.16	—— Degree of Moisture..... 923°
15	53	45	61	40	SW	Brisk	.04	—— Force of Vapour..... 0.304 inch.
16	52	44	65	38	——	Ditto		Least observed degree of Moisture..... 660°
17	51	32	56	25	W	Little	.15	Maximum Temperature in Shade..... 56°
18	49	36	61	30	SW	Brisk	.10	Minimum ditto..... 26°
19	51	41	65	35	W	Strong	.28	Maximum Temperature in the Sun..... 68°
20	50	36	62	32	——	Ditto	.12	Minimum of Terrestrial Radiation..... 19°
21	50	45	60	42	——	Ditto	.08	
22	51	42	63	40	——	Brisk	.07	WINDS.
23	44	30	52	26	NW	Little	.18	
24	45	45	51	41	——	Brisk	.20	North.....0 days. | N. East.....0 days
25	55	37	+68	30	W	Ditto		East.....0 | S. East.....0
26	49	40	68	34	——	Ditto		South.....8 | S. West.....9
27	50	42	63	34	SW	Strong		West.....9 | N. West.....2
28	+56	41	61	34	——	Ditto		28 days.
	49.4	42	58.5	32.8			1.71	Amount of Rain.....1.71 inch.

MARCH.

1826.		Morning.					Noon.					Night.				
	Dnys.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.
☾ W.	1	30.157	43	42	1	Cloudy	30.110	54	47	7	Fine	30.002	50	50	—	Cloudy
Th.	2	29.837	48	48	—	Ditto	29.836	54	53	1	Showery	29.806	50	50	—	Wet
F.	3	—.624	50	50	—	Rainy	—.794	52	52	—	Ditto	—.998	42	42	—	Cloudy
S.	4	—.950	43	43	—	Cloudy	—.731	57	47	10	Fine	—.800	47	47	—	Ditto
S.	5	—.953	46	39	7	Very Fine	—.981	51	36	15	Cloudy	30.184	39	37	2	Fine
M.	6	30.229	32	32	—	Frosty	30.089	47	42	5	Cloudy & Cold	29.899	47	47	—	Wet
Tu.	7	29.907	50	50	—	Wet	29.961	56	55	1	Showery	—.987	53	53	—	Ditto
⊕ W.	8	30.151	51	51	—	Ditto	30.153	60	55	5	Fine	30.141	48	47	1	Fine
Th	9	—.207	44	44	—	Foggy	—.243	66	51	15	Very Fine	—.352	52	50	2	Ditto
F.	10	—.304	46	43	3	Fine	—.324	67	55	12	Ditto	—.412	47	45	2	Ditto
S.	11	—.409	42	40	2	Ditto	—.415	53	42	11	Ditto	—.438	40	38	2	Fine but Cold
S.	12	—.492	40	39	1	Ditto	—.510	51	39	12	Ditto	—.529	39	37	2	Ditto
M.	13	—.525	37	35	2	Ditto	—.476	48	38	10	Fine but Cold	—.302	37	37	—	Clear & Cold
Tu.	14	—.053	41	41	—	Wet	—.045	51	47	4	Fine	—.004	42	41	1	Ditto
W.	15	29.991	48	48	—	Ditto	29.946	53	44	9	Ditto	29.987	38	38	—	Frosty
☽ Th.	16	30.226	35	34	1	Frosty	30.339	46	35	11	Cold	30,430	35	33	2	Ditto
F.	17	—.461	33	30	3	Ditto	—.467	43	32	11	Fine but Cold	—.407	31	30	1	Ditto
S.	18	—.336	29	28	1	Ditto	—.238	46	37	9	Ditto	—.139	39	39	—	Cloudy
S.	19	20.969	41	38	3	Fine	29.947	50	42	8	Fine, Showery	29.983	37	35	2	Clear & Cold
M.	20	30.154	42	40	2	Ditto	30.142	47	40	7	Cold & Clear	30.047	36	33	3	Ditto
Tu.	21	—.033	41	40	1	Ditto	—.249	48	32	16	Ditto	—.237	39	37	2	Ditto
W.	22	29.923	38	37	1	Cold & Windy	29.871	43	40	3	Cold & Stormy	29.831	38	38	—	Slight Rain
○ Th.	23	—.70)	38	35	3	Ditto	—.612	45	45	—	Wet	—.491	35	35	—	Sleet & Rain
F.	24	—.498	37	35	2	Ditto	—.516	42	40	2	Cold & Stormy	—.637	36	36	—	Wet
S.	25	—.807	37	34	3	Ditto	—.797	45	41	4	Ditto	—.825	38	36	2	Cloudy
S.	26	— 805	36	34	2	Cloudy & Cold	—.858	42	30	12	Cold with Hail	30.039	31	28	3	Cold
M.	27	30.037	31	27	4	Clear & Cold	30.035	43	23	20	Clear	—.013	36	35	1	Ditto
Tu.	28	29.944	41	38	3	Fine	29.903	52	43	9	Clear & Fine	29.735	45	45	—	Cloudy
W.	29	— 719	48	44	4	Ditto	—.728	49	35	14	Clear	—.821	35	31	4	Clear
☾ Th.	30	30.222	32	28	4	Ditto	30.169	48	29	19	Ditto	30.383	34	31	3	Ditto
F.	31	— 382	31	27	4	Ditto	—.398	47	31	16	Ditto	—.407	32	31	1	Ditto
		30 064	40.3	38.5	1.84		30.060	50.2	41.2	9		30.108	40	39	1	

MARCH.

Days.	Temperature.				Wind.		Rain.		Remarks.
	Max.	Min.	Sun.	Rad.	Direction.	Force.	In.	Pts.	
1	54	47	61	40	W.	Strong			
2	54	46	60	41	——	Ditto		.45	
3	52	39	64	32	——	Ditto		.20	
4	55	39	69	32	S.W	Brisk			
5	51	29	62	22	W.	Ditto			
6	48	43	50	43	S.	Ditto		.23	
7	57	45	57	41	S.W.	Little		.06	
8	61	43	67	40	——	Ditto			
9	+68	44	75	36	W.	Ditto			
10	67	39	+88	30	S.E	Ditto			
11	54	32	72	21	——	Brisk			
12	51	34	62	25	——	Little			
13	48	35	64	30	——	Brisk			
14	51	40	65	35	S.	Little		.21	
15	53	32	70	20	N.E.	Ditto			
16	47	27	64	18	——	Ditto			
17	45	—26	66	—13	N.	Ditto			
18	50	35	72	30	S.W.	Ditto		.06	
19	51	35	71	26	W.	Brisk			
20	49	35	66	29	N.W.	Ditto			
21	48	35	68	25	N.E.	Ditto			
22	44	37	51	34	N.	Ditto			
23	45	35	50	30	——	Ditto		.33	
24	43	35	49	29	——	Ditto		.08	
25	45	35	61	30	——	Ditto			
26	43	29	54	21	N.E.	Ditto			
27	45	32	67	22	——	Ditto			
28	53	31	61	22	N.	Ditto			
29	51	29	70	20	N.W.	Ditto			
30	50	27	73	18	——	Little			
31	51	28	81	17	——	Ditto			
	47	35	65	28				1.62	

The Easterly winds, as is usual, were the most prevalent during this month; the mornings and evenings were cold and frosty, and unfavourable to the fruit trees, which were in blossom. On the 31st. in the morning, a very beautiful mock sun was observed; it only lasted about a quarter of an hour.

Mean Pressure	30.077 inches.
—— Temperature	43°.4
—— Dew Point	39°.5
—— Degree of Dryness	3°.9
—— Degree of Moisture	860°
—— Force of Vapour	0.272 inch.
Least observed degree of Moisture	500°
Maximum Temperature in Shade	68°
Minimum ditto	26°
Maximum Temperature in the Sun	88°
Minimum of Terrestrial Radiation	13°

Winds.

North.....6 days.	N. East.....5 days.
East.....0	S. East.....4
South 2	S. West.....4
West.....6	N. West.....4

31 days.

Amount of Rain..... 1.62 inch.

APRIL.

1826.		Morning.					Noon.					Night.				
	Days.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.
S.	1	30,445	35	30	5	Clear	30.383	52	30	22	Very Fine	30.319	41	40	1	Cloudy
S.	2	—.209	45	43	2	Cloudy	—.187	55	51	4	Cloudy	—.237	51	50	1	Ditto
M.	3	—.239	50	46	4	Fine	—.284	64	56	8	Fine	—.263	50	49	1	Clear
Tu.	4	—.262	51	46	5	Ditto	—.271	61	51	10	Ditto	—.251	52	52	—	Cloudy
W.	5	—.196	52	48	4	Ditto	—.186	58	41	17	Ditto	—.197	50	47	3	Clear
Th.	6	—.204	53	47	6	Fine	—.202	62	52	10	Cloudy	—.200	51	50	1	Ditto
⊕ F.	7	—.206	52	49	3	Ditto	—.186	60	50	10	Fine	—.297	52	50	2	Ditto
S.	8	—.273	51	50	1	Foggy	—.227	66	50	16	Ditto	—.083	53	52	1	Ditto
S.	9	29.832	53	50	3	Fine	29.827	65	48	17	Ditto	29.879	50	50	—	Cloudy
M.	10	30.018	46	44	2	Ditto	30.036	57	35	22	Ditto	30.140	52	51	1	Ditto
Tu.	11	—	—	—	—	——	—	—	—	—	——	—	—	—	—	——
W.	12	30.014	45	44	1	Cloudy	29.942	55	55	—	Wet	29.715	48	46	2	Fine
Th.	13	—.125	47	46	1	Cloudy	30.241	60	45	15	Fine	30.237	53	51	2	Cloudy
F.	14	—.322	51	50	1	Fine	—.357	64	59	5	Ditto	—.355	53	51	2	Clear
☽ S.	15	—.397	55	53	2	Cloudy	— 351	69	60	9	Ditto	—.297	53	53	—	Cloudy
S.	16	—.257	54	54	—	Foggy	—.317	55	50	5	Ditto	—.344	50	47	3	Fine
M.	17	—.398	47	40	7	Fine	—.378	55	35	20	Ditto	—.372	43	43	—	Foggy
Tu.	18	—.358	44	40	4	Ditto	—.329	62	42	20	Ditto	—.268	45	43	2	Fine
W.	19	—.198	50	46	4	Ditto	—.182	64	36	28	Ditto	—.069	53	50	3	Ditto
Th.	20	29.997	44	41	3	Ditto	29.859	64	35	29	Ditto	29.755	45	42	3	Ditto
F.	21	—.757	44	38	6	Ditto	—.751	64	48	16	Ditto	—.731	55	53	2	Ditto
☉ S.	22	—.645	62	54	8	Ditto	—.757	71	50	21	Ditto	—.845	48	48	—	Slight Rain
S.	23	—.889	50	47	3	Cloudy	—.893	57	37	20	Ditto	—.935	45	44	1	Fine
M.	24	—.971	45	39	6	Fine	— 991	57	32	25	Ditto	30.056	38	36	2	Ditto
Tu.	25	30.095	33	32	1	Fine but Cold	30,135	54	34	20	Hail Showers	20.927	43	43	—	Slight Rain
W.	26	29.808	45	42	3	Cloudy	29.791	54	32	22	Fine	—.751	45	45	—	Cloudy
Th.	27	—.568	43	43	—	Wet	—.523	50	50	—	Wet	—.802	39	38	1	Ditto
F.	28	—.770	37	28	9	Cold & Windy	—.997	47	32	15	Cold & Cloudy	30.053	35	31	4	Cold & Cloudy
☾ S.	29	30.120	43	36	7	Cold	30.134	50	31	19	Ditto	—.203	32	30	2	Cold
S.	30	—.256	40	32	8	Fine	—.260	53	32	21	Ditto	—.265	38	35	3	Fine
		30.097	47	43·3	3·7		30.103	58	43	15		30.098	47	45·5	1·5	

Note. On the 11th, being unwell, no observations were made; the means are calculated on 29 days only.

APRIL.

Days.	Temperature.				Wind.		Rain.		Remarks.
	Max.	Min.	Sun.	Rad.	Direction.	Force.	In.	Pts.	
1	52	40	71	35	N.W.	Little			
2	55	45	56	40	—	Ditto			
3	65	42	+87	35	W.	Ditto			
4	61	48	68	45	N.W.	Ditto		.06	
5	60	48	69	44	W.	Ditto			
6	63	49	71	47	S.W	Ditto			
7	65	47	85	39	W.	Ditto			
8	66	51	82	45	S.W.	Ditto			
9	66	40	82	35	S.	Brisk			
10	58	44	70	37	W.	Ditto			
11	62	46	74	36	N.W.	Ditto			
12	54	45	50	40	N.W.	Ditto		.56	
13	59	45	78	40	N.	Little			
14	62	47	78	45	W.	Brisk			
15	69	50	84	47	N.W.	Little			
16	59	35	83	27	W.	Ditto			
17	55	33	84	24	N.	Ditto			
18	64	37	83	30	N.W.	Ditto			
19	64	39	73	30	W.	Ditto			
20	64	39	75	31	E.	Ditto			
21	70	50	82	42	——	Ditto			
22	+71	48	79	42	S.E.	Ditto		.02	
23	57	33	70	25	S.W.	Ditto			
24	57	32	81	23	N.W.	Ditto			
25	55	45	80	41	—	Ditto		.08	
26	54	40	74	39	S.W.	Ditto		.12	
27	51	31	62	27	N.E.	Brisk		.04	
28	47	31	67	24	—	Ditto			
29	51	—29	71	—19	N.	Ditto			
30	55	35	75	29	E.	Little			
	59.6	42.1	74.8	35.4				0.88	

The greater part of this month the weather was very seasonable and pleasant; the various fruits blossomed abundantly, and great crops were expected; but towards the latter end of the month it became cold with slight frost at night. On the 29th the severe frost killed the young shoots of many trees and shrubs, and injured the young fruit considerably.*

Mean Pressure	30.099 inches.
—— Temperature	50°.6
—— Dew Point	43°.9
—— Degree of Dryness	6°.7
—— Degree of Moisture	79°
—— Force of Vapour	0.316 inch.
Least observed degree of Moisture	377°
Maximum Temperature in Shade	71°
Minimum ditto	29°
Maximum Temperature in the Sun	87°
Minimum of Terrestrial Radiation	19°

WINDS.

North.....3 days.	N. East.....2 days.
East.....3	S. East.....1
South.....1	S. West.....4
West.....7	N. West.....9

30 days.

Amount of Rain..... 0 88 inch.

* See the Report on the effects of this frost in the Horticultural Transactions, vol. vi. page 493.

MAY.

1826.		Morning.					Noon.					Night.				
	Days.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.
M.	1	30.362	40	31	9	Fine	30.305	55	36	19	Very Fine	30.252	38	35	3	Fine
T.	2	—.221	48	40	8	Ditto	—.131	61	40	21	Ditto	—.090	42	40	2	Ditto
W.	3	—.081	45	40	5	Cloudy	—.139	50	50	—	Wet	—.155	40	37	3	Ditto
Th.	4	—.419	45	39	6	Ditto	—.129	49	36	13	Cold & Cloudy	—.105	42	39	3	Cloudy
F.	5	—.091	42	37	5	Cold & Cloudy	—.137	53	43	10	Ditto	—.177	42	38	4	Clear & Cold
S.	6	—.095	43	36	7	Ditto	—.065	48	46	2	Showery	—.113	41	39	2	Clear
⊕ S.	7	—.130	44	39	5	Fine	—.123	49	44	5	Cold & Cloudy	—.117	43	40	3	Clear & Cold
M.	8	—.103	45	40	5	Ditto	—.115	63	43	20	Very Fine	—.119	42	40	2	Ditto
T.	9	—.137	46	39	7	Ditto	—.107	63	37	26	Ditto	—.110	47	43	4	Fine
W.	10	—.116	47	45	2	Ditto	—.087	64	37	27	Ditto	—.112	50	49	1	Cloudy
Th.	11	—.126	47	47	—	Wet	—.147	62	51	11	Ditto	—.202	51	48	3	Ditto
F.	12	—.296	50	41	9	Clear & Windy	—.292	57	45	12	Cold	—.302	47	44	3	Clear
S.	13	—.249	47	41	6	Very Fine	—.261	57	40	17	Very Fine	—.216	40	36	4	Clear & Cold
☽ S.	14	—.177	50	42	8	Ditto	—.161	59	45	14	Ditto	—.159	39	34	5	Ditto
M.	15	—.173	48	42	6	Ditto	—.175	61	47	14	Ditto	—.172	45	41	4	Cold but Fine
T.	16	—.203	50	47	3	Fine	—.170	67	47	20	Ditto	—.133	59	55	4	Fine
W.	17	—.135	53	44	9	Very Fine	—.167	72	55	17	Ditto	—.123	58	53	5	Ditto
Th.	18	—.116	61	53	8	Ditto	—.114	76	57	19	Ditto	—.044	53	47	6	Ditto
F.	19	29.983	51	47	4	Ditto	29.894	71	49	22	Ditto	29.783	55	54	1	Cloudy
S.	20	—.776	58	58	—	Foggy	—.838	66	38	28	Ditto	—.978	48	46	2	Ditto
○ S.	21	30.088	55	50	5	Very Fine	30.120	66	54	12	Ditto	30.075	54	50	4	Very Fine
M.	22	—.109	59	56	3	Ditto	—.059	75	50	25	Ditto	—.077	55	52	3	Ditto
T.	23	—.026	57	51	6	Ditto	29.987	69	41	28	Ditto	29 932	59	54	5	Fine
W.	24	29.885	55	51	4	Cloudy	—.836	70	59	11	Cloudy	—.820	54	54	—	Wet
Th.	25	—.725	54	54	—	Wet	—.713	60	60	—	Wet	—.703	54	54	—	Ditto
F.	26	—.675	54	54	—	Ditto	—.721	64	60	4	Showery	—.808	56	56	—	Cloudy
S.	27	—.812	56	55	1	Cloudy	—.905	68	62	6	Heavy Showrs.	—.909	55	55	—	Ditto
☾ S.	28	—.941	60	57	3	Ditto	—.933	65	55	10	Cloudy	—.862	54	53	1	Ditto
M.	29	—.763	54	54	—	Wet	—.823	54	54	—	Showery	—.916	52	52	—	Heavy Rain
T.	30	—.937	53	53	—	Ditto	—.953	54	54	—	Ditto	—.951	53	53	—	Ditto
W.	31	—.975	54	53	1	Cloudy	—.937	59	57	2	Ditto	—.927	54	54	—	Cloudy
		30.052	50.6	46.3	4.3		30 049	61.5	48.1	13.4		30.046	49	46.6	2.4	

MAY.

Days.	Temperature. Max.	Min.	Sun.	Rad.	Wind. Direction.	Force.	Rain. In.	Pts.
1	55	—31	74	—22	N.	Little		
2	64	35	91	27	——	Ditto		
3	51	36	55	34	——	Ditto		·07
4	49	39	53	33	N.E.	Ditto		
5	53	39	63	32	N.	Ditto		
6	50	36	62	29	N.E.	Brisk		.04
7	51	41	69	33	——	Ditto		
8	64	32	84	25	——	Little		
9	64	39	88	29	E.	Ditto		
10	65	45	94	40	S.E.	Ditto		
11	64	40	71	32	——	Ditto		.09
12	60	40	66	33	N.E.	Brisk		
13	61	35	81	25	E.	Little		
14	62	36	80	27	——	Ditto		
15	63	37	82	28	S.E.	Ditto		
16	69	47	96	39	N.W.	Ditto		
17	73	49	92	40	——	Ditto		
18	+76	50	93	35	S.E.	Ditto		
19	75	53	98	46	W.	Ditto		.04
20	68	43	87	34	N.E.	Brisk		
21	68	50	93	40	——	Little		
22	76	43	+102	34	E.	Brisk		
23	69	54	91	45	N.E.	Ditto		
24	70	51	86	45	——	Ditto		.29
25	60	52	60	52	——	Ditto		
26	64	50	68	44	S.E.	Little		.06
27	68	57	75	48	——	Brisk		.28
28	65	52	74	44	N.E.	Ditto		·39
29	55	49	55	48	——	Little		·97
30	54	52	56	51	——	Ditto		.11
31	59	51	60	51	——	Ditto		.05
	62.4	44	77	38				2.39

Remarks.

In the beginning of this month the weather was much the same as that of the one preceding, cold at nights, and unseasonable. From the 10th to the 23d a series of fine weather set in, and some of the days the thermometer was observed above 70°. The latter part of the month was cloudy, with very heavy rain, and the wind generally from North East.

Mean Pressure	30.049 inches.
—— Temperature	53°.7
—— Dew Point	47°
—— Degree of Dryness	6°.7
—— Degree of Moisture	810°
—— Force of Vapour	0.364 inch.
Least observed degree of Moisture	391°
Maximum Temperature in Shade	76°
Minimum ditto	31°
Maximum Temperature in the Sun	102°
Minimum of Terrestrial Radiation	22°

WINDS.

North	4 days.	N. East	14 days.
East	4	S. East	6
South	0	S. West	0
West	1	N. West	2

31 days.

Amount of Rain ..... 2.39 inches.

JUNE.

1826		Morning.					Noon.					Night.				
	Days.	Barom.	Hygrometer.			Weather.	Baom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.
Th.	1	29.905	55	55	—	Foggy	29.911	61	58	3	Cloudy	29.917	56	56	—	Showery
F.	2	—.926	54	54	—	Wet	—.928	55	55	—	Rainy	30.024	53	52	1	Cloudy
S.	3	30.092	55	51	4	Fine	30.155	64	54	10	Fine	—.220	52	50	2	Fine
S.	4	—.236	60	52	8	Very Fine	—.242	72	61	11	Cloudy	—.272	54	53	1	Ditto
⊕ M.	5	—.327	55	51	4	Ditto	—.343	71	53	18	Very Fine	—.351	55	51	4	Ditto
T.	6	- .339	68	61	7	Ditto	—.319	69	49	20	Ditto	—.257	63	62	1	Cloudy
W.	7	—.229	61	58	3	Ditto	—.264	67	60	7	Cloudy	—.254	55	53	2	Fine
Th.	8	—.279	56	53	3	Ditto	—.266	68	55	13	Very Fine	—.210	58	56	2	Ditto
F.	9	—.113	61	58	3	Ditto	—.049	74	47	27	Ditto	—.001	63	62	1	Very Fine
S.	10	—.008	61	57	4	Ditto	29.992	73	62	11	Ditto, Thund[r].	—.024	61	58	3	Ditto
S.	11	—.125	60	57	3	Ditto	30.153	73	64	9	Very Fine	—.213	63	60	3	Ditto
M.	12	—.253	65	60	5	Hazy	—.293	76	56	20	Ditto	—.257	64	64	—	Foggy
☽ Tu.	13	—.297	66	63	3	Very Fine	—.279	81	61	20	Ditto	—.240	68	67	1	Very Fine
W.	14	—.276	62	59	3	Ditto	—.240	80	66	14	Ditto	—.220	69	65	4	Ditto
Th.	15	—.221	65	61	4	Ditto	—.167	79	59	20	Ditto	—.094	64	61	3	Cloudy
F.	16	—.253	59	51	8	Ditto	—.346	68	45	23	Ditto	—.355	62	58	4	Very Fine
S.	17	—.432	54	51	3	Fine	—.386	69	49	20	Ditto	—.365	63	56	7	Ditto
S.	18	—.346	66	60	6	Very Fine	—.358	76	63	13	Ditto	—.395	62	56	6	Ditto
○ M.	19	—.419	65	56	9	Ditto	—.435	72	55	17	Ditto	—.456	58	51	7	Ditto
T.	20	—.485	59	52	7	Ditto	—.475	72	55	17	Ditto	—.489	61	58	3	Ditto
W.	21	—.487	58	55	3	Ditto	—.426	68	48	20	Ditto	—.420	62	58	4	Ditto
Th.	22	—.414	56	54	2	Cloudy	—.389	68	55	13	Ditto	—.407	60	57	3	Ditto
F.	23	—.444	61	58	3	Fine	—.424	73	45	28	Ditto	—.438	58	51	7	Ditto
S.	24	—.450	61	51	10	Ditto	—.407	77	53	24	Ditto	—.385	51	45	6	Ditto
S.	25	—.373	60	51	9	Ditto	—.369	76	50	26	Ditto	—.318	61	58	3	Ditto
M.	26	—.274	65	60	5	Very Fine	—.254	86	59	27	Ditto	—.165	68	63	5	Ditto, Thund[r].
☾ T.	27	—.067	70	62	8	Ditto	—.031	88	65	23	Ditto	—.009	69	63	6	Sultry
W.	28	—.061	68	63	5	Ditto	—.059	89	65	24	Ditto, Sultry	—.099	62	58	4	Very Fine
Th.	29	—.184	67	62	5	Ditto	—.208	83	58	25	Ditto, Ditto	—.212	61	60	1	Ditto
F.	30	—.238	66	62	4	Ditto	—.220	85	61	24	Very Fine	—.210	62	56	6	Ditto
		30.252	61.3	56.6	4.7		30.246	73.7	56.2	17.5		30.342	60.6	57.3	3.3	

JUNE.

Days.	Temperature.				Wind.		Rain.	Remarks.
	Max.	Min.	Sun.	Rad.	Direction.	Force.	In. Pts.	
1	62	53	65	52	NE	Little	.16	During the whole of this month the weather was very fine and warm, with only a few slight showers on the 1st, 2nd, 6th and 9th. In the afternoon of the 27th a good deal of thunder was heard in the N. West; and at night, as well as on the 28th, the lightning was remarkably vivid in the S. and SW. The hail storm which did so much damage to the glass in the vicinity of, and to the northward of the metropolis, fell on the afternoon of the 29th. It passed to the N. East, and none fell in the Garden of the Society.
2	56	49	80	46	——	Ditto	.18	
3	65	47	79	—39	NW	Ditto		
4	72	51	77	45	——	Ditto		
5	72	46	89	42	N	Ditto		
6	69	57	91	52	NE	Ditto	.02	
7	68	56	84	51	——	Ditto		
8	69	51	85	46	——	Ditto		
9	76	51	91	49	——	Strong	.02	
10	76	51	98	47	——	Little		
11	78	51	94	49	——	Ditto		
12	82	52	102	49	——	Ditto		
13	84	55	101	51	NW	Ditto		
14	81	54	95	51	W	Ditto		
15	80	51	93	45	NW	Ditto		
16	68	—44	87	40	SE	Ditto		
17	77	57	88	51	NW	Ditto		
18	80	52	98	48	——	Ditto		
19	78	48	95	40	NE	Ditto		
20	74	47	92	40	NW	Ditto		
21	71	56	84	51	NE	Ditto		
22	73	47	89	42	E	Ditto		
23	76	50	102	41	——	Brisk		
24	82	46	100	40	——	Little		
25	82	51	102	46	——	Ditto		
26	89	57	108	52	——	Ditto		
27	+93	61	109	57	SE	Ditto		
28	91	57	110	52	NW	Ditto		
29	85	55	100	51	SW	Ditto		
30	85	61	+115	56	——	Ditto		
	74.1	57.1	93.4	47.3			0.38	

Mean Pressure.....30.280 inches.
—— Temperature.....65°.2
—— Dew Point.....56°.7
—— Degree of Dryness..... 8°.5
—— Degree of Moisture..... 74.8°
—— Force of Vapour.....0.492 inch.
Least observed degree of Moisture..... 400°
Maximum Temperature in Shade..... 93°
Minimum ditto..... 44°
Maximum Temperature in the Sun..... 115°
Minimum of Terrestrial Radiation..... 39°

WINDS.

North	1 day	N. East	11 day
East	5	S. East	2
South	0	S. West	2
West	1	N. West	8

30 days.

Amount of Rain.....0.38 inch.

JULY.

1826.		Morning.					Noon.					Night.				
	Days.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.
S.	1	30.184	66	66	—	Slight Rain	30.203	75	65	10	Cloudy	30.224	68	66	2	Very Fine
S.	2	—.273	69	64	5	Very Fine	—.279	82	58	24	Very Fine	—.275	64	60	4	Ditto
M.	3	—.263	69	62	7	Ditto	—.228	86	60	26	Ditto	—.174	71	62	9	Ditto
Tu.	4	—.117	75	65	10	Ditto	—.079	85	60	25	Ditto	29.999	70	68	2	Sultry
⊕ W.	5	29.926	71	65	6	Ditto	29.917	86	68	18	Ditto	—.940	64	61	3	Very Fine
Th.	6	—.985	61	60	1	Cloudy	—.947	82	66	16	Ditto	—.928	74	70	4	Ditto
F,	7	—.890	71	66	5	Ditto	—.854	80	66	14	Ditto	—.789	68	62	6	Ditto
S.	8	—753	67	61	6	Fine	—730	80	68	12	Cloudy	—.714	63	63	—	Slight Rain
S.	9	—.730	70	66	4	Very Fine	—.753	81	65	16	Very Fine	—.724	64	60	4	Very Fine
M.	10	—.797	68	58	10	Ditto	—.839	80	52	28	Ditto	—.885	65	62	3	Ditto
Tu.	11	—.923	66	57	9	Ditto	—.941	75	58	17	Ditto	30.025	66	62	4	Ditto
☽ W.	12	—.951	63	61	2	Cloudy	—.940	69	69	—	Slight Rain	29.792	64	62	2	Cloudy
Th.	13	—.751	66	63	3	Ditto	—.701	72	62	10	Showery	—.683	63	60	3	Very Fine
F.	14	—.780	62	61	1	Fine	—.810	73	61	12	Very Fine	—.897	62	59	3	Ditto
S.	15	—.917	63	60	3	Very Fine	—.908	74	65	9	Cloudy	—.902	62	61	1	Cloudy
S.	16	— 933	62	62	—	Showery	—.816	67	67	—	Wet	—.883	61	56	5	Very Fine
M.	17	—.911	60	51	9	Very Fine	30.020	72	49	23	Very Fine	29.983	65	61	4	Ditto
Tu.	18	30.024	65	59	6	Cloudy	— 012	73	58	15	Cloudy	—.955	66	61	5	Cloudy
○ W.	19	—.010	67	60	7	Very Fine	— 027	72	47	25	Very Fine	30 046	63	56	7	Fine
Th.	20	—.086	61	52	9	Cloudy	—.112	72	56	16	Cloudy	29.862	61	59	2	Cloudy
F.	21	29.651	62	58	4	Ditto	29.644	68	53	15	Ditto	—.667	55	55	—	Wet
S	22	—.796	61	59	2	Very Fine	—.820	69	55	14	Ditto	—.919	61	61	—	Heavy Rain
S.	23	30.023	58	58	—	Heavy Rain	30.031	58	58	—	Rainy	30 069	58	58	—	Cloudy
M.	24	—.061	58	58	—	Cloudy	— 109	70	65	5	Fine	—.124	61	60	1	Fine
Tu.	25	—.176	60	58	2	Fine	—.190	72	61	11	Very Fine	—.197	62	60	2	Ditto
☾ W.	26	— 231	60	58	2	Ditto	—.296	72	63	9	Cloudy	—.331	60	59	1	Ditto
Th.	27	— 359	59	53	6	Very Fine.	—.314	69	54	15	Very Fine	—.270	61	59	2	Ditto
F.	28	—.381	62	57	5	Ditto	—.205	73	56	17	Ditto	—.152	62	60	2	Ditto
S.	29	—.137	57	55	2	Ditto	—.100	78	55	23	Ditto	—.066	65	61	4	Ditto
S.	30	—.078	64	56	8	Ditto	—.075	81	58	23	Ditto	—.041	70	62	8	Very Fine
M.	31	29.985	72	61	11	Ditto	29.970	85	58	27	Ditto	29.959	63	63	6	Sultry
		30.060	64.3	59.7	4.6		29.996	75.2	59.9	15.3		29.968	64.1	60.9	3.2	

JULY.

Days.	Temperature.				Wind.		Rain.	Remarks.
	Max.	Min.	Sun.	Rad.	Direction.	Force.	In. Pts.	
1	78	65	87	52	W.	Little		
2	86	51	111	46	——	Ditto		Throughout the greater part of this month the weather was similar to that of the one preceding, but considerably warmer and more oppressive. Very little rain fell in the beginning of the month, until the night of the 22d, when it came down in torrents, and the quantity which then fell is remarkable.
3	+89	55	112	50	——	Ditto		
4	88	61	+116	55	E.	Brisk		
5	87	56	115	50	S. E.	Ditto		
6	88	62	110	56	S.W.	Little		
7	80	61	112	52	——	Ditto		
8	81	60	98	58	W.	Ditto	.04	
9	83	56	106	45	S.W.	Ditto		Mean Pressure ..... 30.008 inches.
10	81	54	105	46	W.	Brisk		—— Temperature ..... 67°.8
11	77	56	101	48	——	Little		—— Dew Point ..... 60°.1
12	77	62	84	56	——	Ditto		—— Degree of Dryness ..... 7°.7
13	76	52	76	46	S.W.	Strong	.14	—— Degree of Moisture ..... 815°
14	77	57	100	50	W.	Little		—— Force of Vapour ..... 0.560 inch.
15	76	54	104	46	S.W.	Ditto	.04	Least observed degree of Moisture..... 413°
16	73	—46	101	39	——	Ditto	.12	Maximum Temperature in Shade..... 89°
17	80	51	104	46	N.W.	Ditto		Minimum ditto..... 46°
18	77	58	86	51	W.	Ditto		Maximum Temperature in the Sun ..... 116°
19	72	53	101	45	N.W.	Ditto		Minimum of Terrestrial Radiation..... 37°
20	70	57	85	51	S.W.	Brisk	.11	
21	71	52	84	42	S.	Little	.11	
22	70	66	95	51	N.E.	Ditto	1.37	
23	59	54	60	50	——	Brisk	.14	
24	72	52	82	47	——	Ditto		
25	77	54	99	45	——	Little		
26	72	46	94	—37	N.W.	Ditto		
27	75	50	104	42	E.	Ditto		
28	78	46	104	40	S.E.	Ditto		
29	81	50	105	37	S.W.	Ditto		
30	85	56	110	42	S.	Ditto		
31	89	57	107	46	——	Ditto		
	78.2	55	98.6	47.3			2.07	

WINDS.

North.....0 days.	N. East ....4 days.
East 2	S. East.....2
South 3	S. West 8
West 9	N. West....3

31 days.

Amount of Rain ..... 2.07 inches.

AUGUST.

1826.		Morning.					Noon.					Night.				
	Days.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.
T.	1	30.053	72	67	5	Very Fine	30.083	81	65	16	Very Fine	30.056	64	61	3	Fine
W.	2	—.002	62	61	1	Cloudy	29.987	80	72	8	Fine	29.959	66	64	2	Cloudy
⊕ Th.	3	29.913	65	64	1	Ditto	—.962	72	69	3	Cloudy	—.927	67	67	—	Showery
F.	4	—.976	62	60	2	Ditto	—.998	72	65	7	Fine	—.986	65	65	—	Ditto
S.	5	30.022	61	61	—	Cloudy	30.046	69	64	5	Cloudy	30.066	65	61	4	Very Fine
S.	6	—.108	63	60	3	Fine	—.144	70	56	14	Fine	—.183	63	60	3	Ditto
M.	7	—.183	65	60	5	Very Fine	—.185	72	57	15	Very Fine	—.163	67	65	2	Fine
T.	8	—.152	62	60	2	Ditto	—.047	80	68	12	Ditto	—.061	65	62	3	Ditto
W.	9	—.024	63	60	3	Ditto	29.981	78	58	20	Ditto	29.988	66	64	2	Ditto
☽ Th.	10	29.990	65	63	2	Ditto	—.972	76	65	11	Ditto	— 924	63	61	2	Ditto
F.	11	—.909	61	60	1	Cloudy	—.873	66	66	—	Heavy Rain	—.921	58	58	—	Cloudy
S.	12	30.033	57	54	3	Fine	30.062	71	51	20	Very Fine	30.070	54	51	3	Fine
S.	13	—.152	56	51	5	Very Fine	—.212	72	61	11	Ditto	—.088	55	54	1	Ditto
M.	14	29.995	61	56	5	Ditto	29.958	77	54	23	Ditto	—.045	61	59	2	Ditto
T.	15	30.115	66	62	4	Ditto	30.092	72	62	10	Fine	—.024	60	57	3	Ditto
W.	16	29.976	65	63	2	Cloudy	30.008	70	61	9	Cloudy	—.028	61	58	3	Ditto
○ Th.	17	30.108	63	61	2	Fine	—.150	74	57	17	Very Fine	—.126	65	62	3	Ditto
F.	18	—.316	64	62	2	Ditto	—.346	79	61	18	Ditto	—.358	69	65	4	Ditto
S.	19	—.444	62	61	1	Foggy. Fine	—.298	79	63	16	Ditto	—.245	69	67	2	Ditto
S.	20	—.105	68	65	3	Very Fine	—.035	83	59	24	Ditto	29.974	68	65	3	Ditto
M.	21	—.000	62	58	4	Fine	29.982	72	60	12	Ditto	—.959	61	59	2	Ditto
T.	22	29.927	64	62	2	Ditto	—.937	73	59	14	Ditto	—.905	62	60	2	Ditto
W.	23	—.950	66	63	3	Ditto	—.761	70	58	12	Cloudy	—.701	65	65	—	Wet
Th.	24	—.724	62	60	2	Ditto	—.763	75	59	16	Ditto	—.772	64	63	1	Cloudy
☾ F.	25	—.790	66	63	3	Ditto	—.770	73	54	19	Very Fine	— 677	70	70	—	Stormy
S.	26	—.708	62	61	1	Ditto	—.848	75	63	12	Fine	—.899	62	59	3	Fine
S.	27	— 970	62	57	5	Very Fine	30.002	72	52	20	Ditto	30.024	61	58	3	Ditto
M.	28	30.040	59	56	3	Ditto	29.890	74	59	15	Very Fine	29.974	66	65	1	Cloudy
T.	29	29.933	68	66	2	Fine	—.921	75	69	6	Cloudy	—.854	67	65	2	Fine
W.	30	—.774	64	62	2	Very Fine	—.708	82	68	14	Fine	—.723	66	64	2	Cloudy
Th.	31	—.851	65	61	4	Cloudy	—.851	72	54	18	Ditto	—.846	61	60	1	Ditto
		30.335	63.3	60.7	2.6		30.310	74.3	60.9	13.4		30.500	63.4	61.4	2	

AUGUST.

Days.	Temperature.				Wind.		Rain.	Remarks.
	Max.	Min.	Sun.	Rad.	Direction.	Force.	In. Pts.	
1	82	59	107	50	SE	Little		On the 3d some heavy showers of rain fell in the afternoon, and at night the lightning was very vivid and frequent, accompanied with distant thunder. But the most remarkable thunder-storm which has been witnessed for many years, was that of Friday the 25th, which commenced about ½ past 7 P. M. and lasted about two hours. Although some hail fell in the Garden at the commencement of the storm, little damage was done by it to the glass.
2	80	60	94	52	NE	Ditto		
3	77	56	89	50	SE	Ditto	.22	
4	75	55	94	49	——	Ditto	.84	
5	72	51	85	42	——	Ditto		
6	75	55	84	47	NW	Ditto		
7	80	50	102	46	SW	Ditto		
8	80	52	102	45	——	Ditto		
9	79	54	+112	48	——	Ditto		
10	75	53	95	43	W	Ditto		
11	66	47	66	36	SW	Ditto	.26	Mean Pressure.....30.381 inches.
12	72	—42	90	—32	——	Ditto		—— Temperature.....67°
13	74	45	82	36	——	Brisk		—— Dew Point.....61°
14	77	45	96	36	W	Little		—— Degree of Dryness.....6°
15	73	58	89	48	SW	Brisk		—— Degree of Moisture..... 825°
16	75	51	87	42	——	Ditto		—— Force of Vapour.....0.577 inch.
17	76	60	93	51	——	Little		Least observed degree of Moisture..... 553°
18	81	51	100	46	NE	Ditto		Maximum Temperature in Shade ..... 88°
19	86	51	110	41	S	Ditto		Minimum ditto ..... 42°
20	+88	54	104	43	——	Ditto		Maximum Temperature in the Sun ..... 112°
21	76	54	97	45	SE	Ditto		Minimum of Terrestrial Radiation..... 32°
22	76	56	99	46	SW	Ditto		
23	72	56	82	49	S	Brisk	.10	
24	76	57	84	48	SW	Ditto		WINDS.
25	83	58	100	50	S	Ditto	.32	North.....0 days. | N. East.....2 days.
26	76	52	80	43	SW	Ditto		East.....0 | S. East.....5
27	72	46	88	37	W	Little		South.....5 | S. West....13
28	76	58	93	56	——	Ditto		West.....5 | N. West....1
29	76	57	84	48	SW	Ditto		31 days.
30	83	57	101	49	W	Ditto		
31	76	56	98	48	S	Ditto	.26	Amount of Rain.....2.00 inches.
	77	53	93	45			2.00	

SEPTEMBER.

1826.		Morning.					Noon.					Night.				
	Days.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather
F.	1	29.820	58	58	—	Fine	29.804	72	60	12	Cloudy	29.772	62	62	—	Wet
S.	2	—.735	60	60	—	Showery	— 725	66	64	2	Showery	—.713	63	63	—	Cloudy
⊕ S.	3	—.772	65	65	—	Cloudy	—.844	68	65	3	Cloudy	—.937	61	60	1	Ditto
M.	4	—.949	64	63	1	Ditto	—.955	76	70	6	Ditto	—.943	63	63	—	Wet
Tu.	5	—.953	62	60	2	Fine	— 955	66	66	—	Wet	—.903	57	56	1	Cloudy
W.	6	—.634	57	57	—	Wet	—.325	68	68	—	Ditto	—.230	56	55	1	Ditto
Th	7	—.113	56	56	—	Heavy Rain	—.465	59	59	—	Heavy Rain	—.663	53	52	1	Fine
☽ F.	8	—.696	52	52	—	Ditto	—.632	69	65	4	Cloudy	—.741	58	58	—	Cloudy
S.	9	—.778	53	33	—	Ditto	—.812	63	58	5	Fine	—.989	52	50	2	Clear
S.	10	30.027	55	53	2	Fine	30.063	68	56	12	Very Fine	30.138	54	52	2	Ditto
M.	11	—.211	50	48	2	Very Fine	—.221	64	50	14	Ditto	—.259	53	52	1	Fine
Tu.	12	—.239	51	50	1	Fine but Cold	—.229	67	55	12	Ditto	—.174	52	51	1	Ditto
W.	13	—.098	52	51	1	Ditto	—.064	65	56	9	Ditto	— 000	53	52	1	Ditto
Th.	14	29.939	56	54	2	Fine	29.942	67	60	7	Cloudy	—.068	56	56	—	Wet
F.	15	30.229	52	50	2	Ditto	30.281	62	50	12	Fine	—.326	48	48	—	Cloudy
○ S.	16	—.302	47	47	—	Heavy Fog	—.251	65	51	14	Ditto	—.143	50	50	—	Ditto
S.	17	—.023	52	51	1	Fine	29.955	71	60	11	Ditto	29 932	57	57	—	Ditto
M.	18	29.847	50	50	—	Wet	—.824	61	61	—	Heavy Rain	—.725	62	62	—	Rainy
Tu.	19	—.862	63	62	1	Fine	—.911	70	61	9	Very Fine	—.913	62	61	1	Hazy
W.	20	—.848	60	60	—	Wet	—.834	61	61	—	Showery	—.941	56	55	1	Fine
Th.	21	30.037	55	53	2	Fine	30.081	62	58	4	Fine	30.117	49	47	2	Very Fine
F.	22	—.138	47	44	3	Fine but Cold	—.251	60	48	12	Ditto	—.151	47	46	1	Ditto
S.	23	—.095	43	42	1	Ditto	—.003	64	50	14	Ditto	29.936	52	51	1	Cloudy
☾ S.	24	29.758	57	57	—	Cloudy	29.728	65	59	6	Cloudy	—.661	60	60	—	Ditto
M.	25	— 696	61	61	—	Wet	—.791	66	66	—	Wet	—.780	59	58	1	Ditto
Tu.	26	—.810	60	60	—	Ditto	—.891	70	62	8	Fine	—.879	61	61	—	Ditto
W.	27	—.862	61	60	1	Fine	30.015	68	58	10	D to	30.057	59	59	—	Ditto
Th.	28	30.161	60	59	1	Dit o	—.178	70	65	5	Very Fine	—.216	56	55	1	Fine
F.	29	—.165	61	61	—	Thick Fog	—.121	70	66	4	Cloudy	29.995	60	60	—	Foggy
S.	30	29.796	63	63	—	Slight ditto	29.784	69	66	3	Ditto	—.934	57	57	—	Cloudy
		29 919	56.1	55.33	.76		29.931	66	59.1	6.6		29.941	56.2	55.6	.6	

SEPTEMBER.

Days,	Temperature. Max.	Min.	Sun.	Rad.	Wind. Direction.	Force.	Rain. In.	Pts.	Remarks.
1	74	58	92	50	S.E.	Little		.05	
2	66	59	66	53	N.E.	Ditto		.23	
3	71	55	72	48	——	Ditto			During the first part of the month the weather was very wet, but towards the middle it became more settled. The night of the 22d was frosty, and the Dahlias, then in full flower, were destroyed. Slight fogs at night were not unfrequent.
4	76	53	91	46	——	Ditto		.58	
5	66	51	71	43	——	Ditto		.11	
6	68	55	68	46	S.W.	Ditto		.59	
7	59	48	59	41	N.W.	Ditto		.26	
8	69	49	74	43	——	Ditto		.60	
9	66	46	83	39	W.	Ditto			
10	70	42	75	34	S.W.	Brisk			
11	67	39	94	34	——	Little			
12	68	42	84	37	W.	Ditto			
13	67	47	87	40	——	Ditto			
14	67	45	80	36	——	Ditto		.10	
15	64	37	93	32	N.E.	Ditto			
16	67	42	91	36	S.	Ditto			
17	+76	47	+101	40	S.W.	Ditto			
18	62	57	64	50	N.E.	Brisk		.40	
10	75	59	92	55	E.	Little			
20	63	49	74	42	N.E.	Brisk		.04	
21	62	38	86	31	S.	Ditto			
22	62	—34	85	—28	S.E.	Little			
23	65	50	90	44	——	Ditto			
24	67	59	98	52	——	Ditto		.17	
25	68	52	77	47	——	Ditto		.18	
26	70	59	89	54	S.	Ditto		40	
27	69	51	80	45	S.W.	Ditto			
28	70	51	84	46	——	Ditto			
29	70	56	79	49	S.	Ditto			
30	70	44	81	40	S.W.	Ditto			
	67.8	49	81.2	46			3	71	

Mean Pressure ..... 29.930 inches.
—·— Temperature..... 59°.4
—— Dew Point ..... 56°.7
—— Degree of Dryness ..... 2°.7
—— Degree of Moisture..... 906°
—— Force of Vapour ..... 0.492 inch.
Least observed degree of Moisture..... 622°
Maximum Temperature in Shade ..... 76°
Minimum ditto ..... 34°
Maximum Temperature in the Su ..... 101°
Minimum of Terrestrial Radiation ..... 28°

WINDS.

North .....0 days		N. East ....7 days.	
East.....1		S. East.....5	
South.....4		S. West 7	
West 4		N.-West ...2	
	30 days.		

Amount of Rain..... 3.71 inches.

OCTOBER.

1826.		Morning.					Noon.					Night.				
	Days.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.
⊕ S.	1	29.856	59	58	1	Cloudy	29.912	64	62	2	Showery	29.887	48	48	—	Thick Fog
M.	2	—.955	49	49	—	Thick Fog	—.961	61	57	4	Fine	—.969	52	52	—	Ditto
Tu.	3	—.932	46	46	—	Slight ditto	—.934	59	56	3	Cloudy	—.807	48	48	—	Ditto
W.	4	—.799	48	48	—	Foggy	—.821	54	51	3	Ditto & Cold	—.823	45	44	1	Clear
T.	5	—.799	40	39	1	Cold & Clear	—.825	55	48	7	Fine	—.994	40	38	2	Ditto & Cold
F.	6	30.122	35	34	1	Frosty	30.154	50	39	11	Ditto	30.196	36	35	1	Frosty
S.	7	—.136	34	33	1	Ditto	—.114	58	51	7	Cloudy	—.037	53	53	—	Cloudy
☽ S.	8	29.998	56	56	—	Wet	29.926	64	62	2	Ditto	29.839	55	55	—	Wet
M.	9	—.817	50	49	1	Fine	—.803	55	48	7	Ditto	—.831	43	43	—	Ditto
Tu.	10	—.764	50	50	—	Rainy	—.706	62	62	—	Rainy	—.900	60	58	2	Cloudy
W.	11	30.045	60	58	2	Fine	30.070	69	61	8	Fine	30.130	59	59	—	Clear
T.	12	30.132	61	61	—	Slight Rain	—.117	65	61	4	Cloudy	—.075	59	59	—	Cloudy
F.	13	—.051	60	59	1	Cloudy	—.073	67	63	4	Fine	—.279	50	50	—	Ditto
S.	14	—.249	48	46	2	Ditto	—.199	60	57	3	Cloudy	—.126	56	56	1	Clear
○ S.	15	29.977	58	56	2	Ditto	29.948	65	58	7	Fine	29.739	50	50	—	Ditto
M.	16	—.619	58	56	2	Fine	—.611	60	59	1	Showery	—.859	47	46	1	Ditto
Tu.	17	—.963	40	40	—	Foggy	30.027	62	51	11	Fine	30.003	45	45	—	Foggy
W.	18	—.996	51	51	—	Ditto	—.039	60	58	2	Foggy	—.052	59	59	—	Ditto
T.	19	30.021	55	54	1	Cloudy	—.007	61	60	1	Cloudy	—.031	59	58	1	Cloudy
F.	20	29.982	59	58	1	Ditto	29.996	62	60	2	Ditto	29.988	57	57	—	Ditto
S.	21	— 990	57	57	—	Ditto	—.981	69	66	3	Fine	30.009	56	56	—	Ditto
S.	22	—.948	60	60	—	Ditto	—.944	61	61	—	Wet	29.881	59	59	—	Wet
M.	23	—.917	59	58	1	Ditto	—.897	63	63	—	Showery	—.949	53	53	—	Ditto
☾ Tu.	24	—.967	55	54	1	Ditto	—.925	62	59	3	Fine	—.777	54	54	—	Cloudy
W.	25	—.437	55	55	—	Heavy Rain	—.409	60	60	0	Showery	—.471	47	47	—	Ditto
T.	26	—.441	46	45	1	Cloudy	—.548	57	51	6	Fine	—.641	40	40	—	Ditto & Cold
F.	27	—.686	45	45	—	Wet	—.921	55	55	—	Showery	—.939	47	45	2	Clear
S.	28	30.140	40	38	2	Cold & Cloudy	30.141	55	48	7	Cloudy	30.241	44	43	1	Cloudy
S.	29	—.217	46	45	1	Fine	—.151	54	51	3	Ditto	—.105	53	53	—	Wet
M.	30	—.137	51	51	—	Wet	—.143	55	55	—	Ditto	—.064	55	55	—	Foggy
⊕ Tu.	31	—.098	51	48	3	Cloudy	—.118	54	45	9	Ditto & Cold	—.035	47	47	—	Wet.
		29.941	50.7	49.9	.8		29 949	59.9	56	3.9		29.957	50.84	50.45	.38	

OCTOBER.

Days.	Temperature.				Wind.		Rain.		Remarks.
	Max.	Min.	Sun.	Rad.	Direction.	Force.	In.	Pts.	
1	65	42	74	35	S.W.	Little		.12	
2	64	42	84	34	——	Dicto			
3	61	43	82	34	S.	Ditto			Throughout the greater part of the month the weather was cloudy and damp, with some heavy fogs at night, and the quantity of rain which fell rather exceeded the average mean.
4	57	34	72	27	——	Ditto			
5	57	—29	74	—22	S.W.	Ditto			
6	55	29	+85	22	W.	Ditto			
7	60	44	70	36	S.W.	Ditto			
8	65	45	73	38	S.	Brisk		.18	Mean Pressure..... 29.949 inches.
9	57	41	72	35	S.W.	Little			—— Temperature..... 53°.80
10	63	56	65	51	W.	Ditto		.31	—— Dew Point ..... 52°.12
11	69	57	72	51	——	Ditto		.05	—— Degree of Dryness..... 1°.68
12	67	60	81	53	N.W.	Ditto			—— Degree of Moisture..... 964°
13	68	42	77	35	S.W.	Brisk			—— Force of Vapour .. .. 0.428 inch.
14	62	51	70	45	N.E	Little			Least observed degree of Moisture ..... 696°
15	67	50	75	45	N.W.	Ditto			Maximum Temperature in Shade ..... 72°
16	62	36	77	29	W.	Brisk		.12	Minimum ditto ..... 29°
17	63	45	76	36	N.W.	Little			Maximum Temperature in the Sun ..... 85°
18	61	56	62	51	E.	Brisk			Minimum of Terrestrial Radiation ..... 22°
19	62	57	67	54	——	Ditto			
20	63	56	68	51	S.E.	Ditto			WINDS.
21	+72	52	84	45	S.	Little			North ..... 0 days. | N. East..... 1 days.
22	62	51	62	48	S.W.	Ditto		.27	East..... 2 | S. East..... 2
23	64	48	64	45	W.	Ditto		.40	South ..... 5 | S. West..... 9
24	62	51	70	48	S.W.	Brisk			West ..... 5 | N. West 7
25	60	41	66	34	S.	Ditto		,30	31 days.
26	58	35	71	29	N.W.	Ditto			
27	57	37	57	30	——	Ditto		.24	
28	54	40	66	34	——	Little			Amount of Rain ..... 2.14 inches.
29	54	50	55	47	——	Ditto		.04	
30	54	44	57	40	S.E.	Brisk		.08	
31	54	35	61	32	S.W.	Little		.03	
	61.2	45.1	70.6	39.2				2.14	

NOVEMBER.

1826.		Morning.					Noon.					Night.				
	Days.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.
W.	1	29.823	40	36	4	Cold & Cloudy	29.663	51	50	1	Showery	29.675	40	40	—	Stormy
Th.	2	—.816	38	34	4	Clear & Stormy	—.868	50	45	5	Cold & Stormy	—.947	44	42	2	Ditto
F.	3	—.951	44	41	3	Ditto	—.902	52	47	5	Cold. Fine.	—.823	47	47	—	Wet
S.	4	—.790	44	44	—	Heavy Rain	—.851	48	48	—	Wet	—.916	45	45	—	Ditto
S.	5	—.941	45	45	—	Cloudy	—.883	49	49	—	Ditto	—.873	44	44	—	Heavy Rain
☽ M.	6	—.811	48	48	—	Wet	—.776	50	50	—	Ditto	—.929	36	35	1	Cloudy
T.	7	—.979	31	29	2	Frosty	—.983	45	42	3	Fine	30.116	32	31	1	Frosty
W.	8	30.022	31	28	3	Ditto	30.132	41	36	5	Ditto	—.199	31	30	1	Ditto
Th.	9	—.221	31	30	1	Ditto	—.231	42	39	3	Cold & Cloudy	—.290	31	31	—	Ditto
F.	10	—.139	35	34	1	Cold & Cloudy	—.036	40	39	1	Ditto & Wet	29.959	48	48	—	Foggy
S.	11	29.854	48	48	—	Ditto	29.791	50	49	1	Cold & Cloudy	—.690	52	52	—	Ditto
S.	12	—.719	42	42	—	Fine	—.656	52	46	6	Fine	—.541	39	38	1	Fine
M.	13	—.504	40	38	2	Cloudy	—.351	48	45	3	Cloudy	28.752	41	41	—	Heavy Rain
○ T.	14	—.156	40	37	3	Cold but Fine	—.175	46	42	4	Ditto	29.366	40	38	2	Clear
W.	15	—.618	39	37	2	Ditto & Clear	—.694	45	41	4	Fine	—.872	33	32	1	Ditto
Th.	16	—.999	30	27	3	Cold & Frosty	30.038	48	42	6	Ditto	—.989	42	40	2	Cloudy
F.	17	—.933	44	44	—	Wet	29.989	48	46	2	Cold & Cloudy	30.172	37	37	—	Ditto
S.	18	30.174	43	43	—	Slight Rain	30.156	47	46	1	Ditto	—.192	46	46	—	Wet
S.	19	—.216	45	45	—	Ditto	—.218	45	45	—	Wet	—.292	44	44	—	Ditto
M.	20	—.398	44	43	1	Cold & Cloudy	—.415	47	45	2	Cold & Cloudy	—.504	42	42	—	Ditto
T.	21	—.529	43	41	2	Ditto	—.521	45	41	4	Ditto	—.510	39	38	1	Cloudy
☾ W.	22	—.466	42	39	3	Fine	—.397	45	42	3	Ditto	—.335	44	43	1	Ditto
Th.	23	—.109	48	46	2	Ditto	—.055	50	44	6	Fine	29.883	44	44	—	Wet
F.	24	29.571	47	45	2	Ditto	29.488	48	44	4	Ditto but Cold	—.420	33	31	2	Fine
S.	25	—.212	32	29	3	Frosty	—.189	42	36	6	Cold	—.260	32	31	1	Ditto
S.	26	—.374	26	24	2	Ditto	—.384	36	32	4	Ditto	—.562	33	31	2	Frosty
M.	27	—.713	28	25	3	Ditto	—.783	35	30	5	Fine but Cold	—.878	30	30	—	Ditto
T.	28	—.828	32	32	—	Cloudy	—.751	44	44	—	Slight Rain	—.603	45	45	—	Wet
⊕ W.	29	—.418	46	46	—	Wet	—.395	50	50	—	Ditto	—.442	42	42	—	Cloudy
Th.	30	—.424	47	47	—	Cloudy	—.448	49	48	1	Cloudy	—.573	42	42	—	Ditto
		29.873	39.7	38.2	1.5		29.834	46.2	43.4	2.8		29.827	39.9	39.3	.6	

NOVEMBER.

Days.	Temperature.				Wind.		Rain.	Remarks.
	Max.	Min.	Sun.	Rad.	Direction.	Force.	In. Pts.	
1	52	38	+72	34	NW	Strong	.06	
2	52	41	62	36	——	Ditto		
3	53	50	64	44	N	Ditto	.82	The weather during the greater part of the month was dull and cloudy, but mild for the season of the year. On the 13th the sudden depression of the barometer was very remarkable.
4	48	41	48	35	NE	Brisk	.44	
5	49	44	49	40	——	Ditto	.23	
6	52	27	53	20	NW	Little	.03	
7	45	28	62	20	W	Ditto		
8	41	27	45	19	——	Ditto		Mean Pressure..... 29.858 inches.
9	46	27	62	21	SW	Ditto		—— Temperature..... 41°.9
10	44	42	47	40	S	Ditto	.05	—— Dew Point ..... 40°.3
11	+55	38	66	33	——	Ditto		—— Degree of Dryness. ..... 1°.6
12	55	32	68	25	——	Ditto		—— Degree of Moisture ..... 959°
13	50	36	55	32	——	Ditto	.66	—— Force of Vapour..... 0.280 inch.
14	46	37	60	31	NW	Brisk		Least observed degree of Moisture..... 822°
15	46	26	65	20	W	Little		Maximum Temperature in Shade ..... 55°
16	49	37	63	37	SW	Ditto	.15	Minimum ditto ..... 21°
17	49	34	55	31	NW	Ditto		Maximum Temperature in the Sun ..... 72°
18	48	41	48	41	——	Brisk	.06	Minimum of Terrestrial Radiation ..... 17°
19	46	39	46	37	N	Ditto	.08	
20	47	39	49	37	NE	Ditto		
21	45	39	46	39	——	Little		
22	45	40	47	37	——	Ditto		
23	52	40	72	39	——	Ditto	.06	
24	49	30	50	24	NW	Ditto		
25	42	−21	51	−17	——	Brisk		
26	41	25	52	20	——	Little		
27	40	27	50	19	——	Ditto		
28	52	44	61	40	S	Ditto	.20	
29	51	37	57	32	——	Ditto	.05	
30	49	29	47	25	SE	Ditto		
	47·9	35·2	55·7	30.8			2.89	

Winds.

North.....	2 days	N. East.....	6 days
East	0	S. East.....	1
South	6	S. West.....	2
West	3	N. West....	10

30 days.

Amount of Rain.....2.89 inches.

DECEMBER.

1826.		Morning.					Noon.					Night.				
	Days.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather
F.	1	29.549	35	35	—	Foggy	29.317	47	47	—	Wet	29.238	44	44	—	Wet
S.	2	—.224	38	36	2	Clear & Cold	—.288	47	40	7	Fine	—.222	42	42	—	Foggy
S.	3	—.321	39	37	2	Fine	—.292	47	45	2	Showery	—.462	36	36	—	Clear
M.	4	—.478	32	29	3	Frosty	—.517	40	37	3	Fine	—.771	35	34	1	Ditto
Tu.	5	—.676	39	37	2	Cloudy	—.763	40	35	5	Ditto	—.715	37	37	—	Wet
☽ W.	6	—.680	37	37	—	Wet	—.696	42	42	—	Showery	—.733	42	42	—	Ditto
T.	7	—.651	43	43	—	Ditto	—.487	54	54	—	Ditto	—.437	51	51	—	Ditto
F.	8	—.316	48	48	—	Slight rain	—.382	51	47	4	Cloudy	—.667	49	49	—	Foggy
S.	9	—.921	38	37	1	Clear & Cold	—.926	53	53	—	Showery	—.877	47	47	—	Wet
S.	10	—.895	50	50	—	Wet	—.910	55	55	—	Ditto	—.924	51	51	—	Foggy
M.	11	—.902	51	51	—	Ditto	—.879	55	53	2	Cloudy	—.940	47	47	—	Ditto
Tu.	12	—.865	48	48	—	Ditto	—.772	52	50	2	Ditto	—.605	48	48	—	Cloudy
W.	13	—.597	50	50	—	Ditto	—.560	54	52	2	Fine	—.645	43	43	—	Ditto
○ T.	14	—.637	45	44	1	Cloudy	—.621	50	49	1	Showery	—.655	46	46	—	Wet
F.	15	—.639	42	41	1	Ditto	—,651	48	47	1	Cloudy	—.634	46	46	—	Ditto
S.	16	—.616	47	47	—	Thick Fog	—.658	49	46	3	Ditto	—.753	47	46	1	Cloudy
S.	17	—.908	45	44	1	Cloudy	—.865	45	44	1	Ditto	—.984	45	45	—	Ditto
M.	18	30.014	43	42	1	Cloudy	30 026	44	42	2	Ditto	30.104	40	39	1	Ditto
Tu.	19	—.082	40	39	1	Ditto	—.096	42	39	3	Ditto	—.104	42	42	—	Foggy
W.	20	29.898	39	39	—	Thick Fog	29.745	43	40	3	Cold & Cloudy	29.571	40	40	—	Wet
T.	21	—.670	40	36	4	Fine	—.818	43	38	5	Fine	30.126	36	35	1	Frosty
☾ F.	22	30.205	29	27	2	Frosty—Fine	30.302	40	33	7	Ditto	—.288	41	41	—	Foggy
S.	23	—.284	45	45	—	Fog	—.264	51	51	—	Foggy	—.319	47	47	—	Ditto
S.	24	—.333	46	46	—	Wet	—.341	49	48	1	Cloudy	—.349	45	45	—	Cloudy
M.	25	—.399	45	45	—	Cloudy	—.363	52	50	2	Ditto	—.373	45	45	—	Ditto
Tu.	26	—.469	43	43	—	Foggy	—.473	43	39	4	Ditto	—.531	42	42	—	Ditto
W.	27	—.560	44	42	2	Fine	—.582	45	41	4	Fine	—.626	41	41	—	Ditto
⊕ T.	28	—.600	32	30	2	Frosty	—.604	39	33	6	Ditto	—.590	32	31	1	Ditto
F.	29	—.545	41	40	1	Fine	—.494	45	41	4	Ditto	—.295	45	45	—	Ditto
S.	30	—.257	45	41	4	Ditto	—.217	50	43	7	Ditto	—.253	46	45	1	Fine
S.	31	—.289	45	41	4	Ditto	—.262	49	45	4	Ditto	—.255	46	45	1	Ditto
		29.919	42	40.9	1.1		30.134	47.2	44.5	2.7		29.937	43.3	43.1	.2	

DECEMBER.

Days.	Temperature.				Wind.		Rain.		Remarks.
	Max.	Min.	Sun.	Rad.	Direction,	Force.	In.	Pts.	
1	47	37	47	32	N.W.	Strong		.25	
2	47	39	51	35	——	Ditto			The weather during this month was much the same as
3	48	31	52	24	W.	Brisk			that of the preceding, cloudy and mild. Some snow fell
4	42	35	52	28	N.W.	Ditto			in the morning of the 5th, but soon melted. Towards
5	40	32	46	30	W.	Brisk		.18	the latter part of the month the height of the Barometer
6	42	39	42	38	——	Ditto		.21	was extraordinary.
7	55	47	59	41	——	Ditto		.14	
8	52	37	59	30	S.W.	Ditto			Mean Pressure..... 29.996 inches.
9	53	48	56	44	S.	Little		.24	—— Temperature ..... 44°.1
10	+56	49	57	46	——	Strong		.20	—— Dew Point ..... 42°.8
11	56	44	65	40	——	Little			—— Degree of Dryness..... 1°.3
12	54	48	64	43	W.	Ditto		.07	—— Degree of Moisture ..... 957°
13	54	33	+67	30	S.W.	Ditto		.10	—— Force of Vapour..... 0.304 inch.
14	51	39	62	34	S.	Ditto		.09	Least observed degree of Moisture ..... 790°
15	49	46	57	41	——	Ditto		.06	Maximum Temperature in Shade ..... 56°
16	50	42	56	41	——	Ditto			Minimum ditto ..... 27°
17	47	41	51	38	S. E.	Ditto			Maximum Temperature in the Sun ..... 67°
18	44	38	46	34	S.	Ditto			Minimum of Terrestrial Radiation ..... 21°
19	42	38	45	31	——	Ditto			
20	43	39	51	34	——	Ditto		.23	WINDS.
21	43	—27	67	—21	N.W.	Ditto			
22	41	41	52	34	——	Ditto			North ..... 2 days | N. East..... 1 days.
23	51	47	51	43	——	Ditto			East..... 0 | S. East 1
24	50	41	50	37	N.	Ditto			South ..... 9 | S. West 2
25	53	40	53	36	N.W.	Ditto			West ..... 7 | N. West.... 9
26	44	39	48	34	——	Ditto			31 days.
27	45	32	52	28	N.E.	Brisk			
28	40	31	52	25	N.	Ditto			Amount of Rain..... 1.77 inch.
29	45	43	47	39	N.W.	Little			
30	51	35	60	31	W.	Ditto			
31	50	44	62	40	——	Ditto			
	48	39.4	54	35				1.77	

The annexed Diagrams have been constructed from the preceding Journal, as the simplest way of exhibiting at one view, the differences in the pressure and temperature of the atmosphere, as well as in the quantity of rain. The following explanatory remarks will be useful.

The upper Diagram is intended to shew the mean ascent and depression of the mercurial column in the Barometer, at the three different periods of observation in the day, for each month in the year; the three perpendicular faint lines in each month's column indicating the three periods; the first being the morning, the second noon, and the third night. The average mean of the whole is 30.067 inches.

In the middle Diagram, the upper and lower lines shew the extremes of temperature, or the highest and lowest state of the thermometer in each month, the degree observed and noted, being marked on the centre line of each month's column. The upper middle line, shews the variations in the mean temperature; and the under middle line, that of the dew-point; the observations being made at the same periods of the day as those of the barometer. The average mean temperature is 52°; that of the dew-point 47°.7.

From the results deduced by Mr. Howard, from twenty years observations made by the Royal Society, it appears, as is stated in Mr. Daniell's Meteorological Essays, first Edition, page 266, that the mean height of the Barometer during that period was 29.8655 inches; the mean temperature 49°.5; and the mean dew-point 44°.5. The mean height of the Barometer in 1826 was 0.201 inch above that mean, whilst the temperature and dew-point were also cor-

Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

Barometer

Daniell's

Mean Height of the Barometer in 1826

Fahrenheit's Thermometer

Mean and Extremes of Temperature and Mean of the Dew-Point in 1826

Rain Gage

Monthly depth of Rain in 1826

W. B. B. del.

Lowry sculp.

respondingly higher; the mean of the former having been 2° 5′, and that of the latter 3° 2′, above Mr. HOWARD's means of twenty years.

The lower diagram exhibits the quantity of Rain which fell in each month, expressed in inches and hundredths of inches.

XII. *On Orache, its Varieties and Cultivation. By Mr.* WILLIAM TOWNSEND, *Under Gardener in the Kitchen Garden Department of the Garden of the Horticultural Society at Chiswick.*

Read December 19, 1826.

GARDEN Orache, or Mountain Spinach, Atriplex hortensis, is more grown in the gardens of cottagers than in those of more affluent persons. It is a native of Tartary, though often seen apparently wild in Great Britain in the neighbourhood of gardens, from which it had strayed. It was cultivated for culinary purposes in the time of PARKINSON,* who calls it Atriplex, sive Olus aureum, Arrach or Orach; two varieties were known to him and to the older botanists,† *viz;* the White Orach, or A. hortensis alba sive pallidè virens, and the Purple Orach, or A. hortensis rubra. A few plants yield sufficient produce to supply a small family with Spinach, which is the chief object in its cultivation. It is more attended to in France (where it is known by the various names‡ of Arroche des Jardins, Irible, Follette, Bonne-Dame, Belle-Dame, Chou d'Amour, and Chou d'Armou), than in Great Britain, it being used in the former country both by itself as a Spinach, as well as mixed with Sorrel, for the purpose of correcting the acidity of the latter. Some

* PARKINSON's Paradisus, page 488. † BAUHIN's Pinax, page 119.

‡ See Bon Jardinier, for 1826, page 114; and NOISETTE, Manuel Complet du Jardinier, Tom. ii. Part 2, page 304.

English Horticultural writers enumerate two, others three, and some four varieties. Besides its name of Garden Orache, or Mountain Spinach, it is called by British gardeners, French Spinach and Bourdeaux Spinach. The French have several kinds, distinguished by names quoted here as Synonyms to some of the seven varieties which were raised last summer in the Garden of the Horticultural Society, and which are intended to be now described. These, though differing but little from each other for culinary purposes, are worthy of notice, and deserving of cultivation, on account of the beauty and variety of their foliage. MILLER, in the Eighth Edition of his Dictionary, mentions three sorts, the Deep Green, the Dark Purple, and the Green with Purple Borders, these, he observes, never vary from seed. My experience however leads me to state, that the varieties occasionally sport.

1. White Orache.

Synonyms.

Atriplex hortensis alba, C. Bauhin.
Atriplex hortensis pallidè virens, C. Bauhin.
White French Spinach, of the Dutch.
Pale Green Orache, Neill.*
Arroche blonde, Bon Jardinier.
Arroche blanche, Jardin Potager.†
Arroche vert jaunâtre, Noisette.‡

The leaves are of a yellowish-green, very rugose with acuminated points, and are much dentated towards the base, which forms two acute angles. The stem and petioles are

* Art. Horticulture, in Edinburgh Encyclopædia.
† L'Ecole du Jardin Potager, Paris, 12mo. 1802.
‡ Manuel Complet du Jardinier.

the same colour as the foliage. The plant is of dwarfish growth.

2. Red Stalked White Orache.

Synonym.

Green Orache with purple borders, Miller.

The leaves are somewhat cordate, of a yellowish-green tinged with brown, their margin is stained with purple, and a little dentated in some cases, but not in all. The stem and petioles are of a palish red and are slightly furrowed, as well as streaked with pale white between the furrows. The plant is of dwarfish growth.

3. Green Orache.

Synonyms.

Atriplex hortensis nigricans, Bryant.*

Dark Green Orache, Bryant.

Deep Green Orache, Miller.

The leaves of this are a dark grass-green colour, very rugose and slightly dentated, broad, terminating rather obtusely, and forming two acute angles at the base. The stem and petioles are the same colour as the leaves, and are very strong. This is the dwarfest variety of all. The existence of this in former times is noticed by Caspar Bauhin in his Pinax above referred to, though not distinguished by him as a variety.

4. Red Stalked Green Orache.

The leaves are dark-green tinged with a dull brown, very rugose and slightly dentated, somewhat curled, terminating rather obtusely, and forming two acute angles at the base. The stem and petioles are a deep red and slightly furrowed, the veins are very prominent. This is of tall growth.

* Flora Diætetica, London, 8vo. 1783.

5. Lurid Orache.

Synonym.

Arroche rouge pâle, Noisette.

The leaves are a pale purple tinged with dark green, the under surface a lightish purple with green veins, slightly wrinkled, terminating rather acutely, and dentated only towards the base, which forms two very acute angles. The stem and petioles are a bright red, and slightly streaked with white between the furrows. Grows to nearly the same height as the preceding.

6. Purple Orache.

Synonyms.

Atriplex hortensis rubra, C. Bauhin.

Red Orache, Bryant.

Dark Purple Orache, Miller.

Arroche rouge, Bon Jardinier.

The leaves are a dull dark purple, more rugose than those of the preceding and more deeply dentated, terminating rather obtusely, and forming two acute angles at the base. The stem and petioles are deep red and slightly furrowed. This is also a tall growing plant.

7. Red Orache.

Synonyms.

Atriplex hortensis ruberrima, Desfontaines.*

Arroche très-rouge, Bon Jardinier.

Arroche rouge foncé, Noisette.

The leaves are oblong-cordate, somewhat wrinkled and slightly dentated; the upper surface is very dark, inclining

* Tableau de l'Ecole de Botanique, &c. Paris, 8vo. 1815.

to a dingy purple; the under surface is a much brighter colour. The stems are a deep red and slightly furrowed. This grows nearly as tall as the preceding.

The Cultivation of the Garden Orache.

A portion of ground having been previously prepared and made moderately rich and light, in an open situation, the seeds should be sown early in the spring, in drills at the distance of two feet apart, made with a draw hoe, and very shallow. When the plants are about three inches high, they should be thinned with a small hoe, so as to leave them room to grow strong; when they have again grown too thick, they should be thinned to the distance of two feet from each other. Afterwards they require no other attention than to be kept clean from weeds. If a late supply is required, a sowing can be made towards the end of June, which will furnish the table until the plants are destroyed by frost. This sowing requires the same management as the first. From the first crop, a quantity may be transplanted in the spring at the distance of eighteen inches from each other each way; these will come into use in succession; when transplanted, they do not grow so large as those which remain where they are sown. In poor soils, the leaves do not become sufficiently succulent for culinary purposes.

XIII. *On Planting the Moist alluvial Banks of Rivers with Fruit-trees. In a Letter to the Secretary. By Mr.* John Robertson, *F. H. S.*

Read September 19, 1826.

Sir,

Few situations combine so many advantages for the plantation of Orchards or Fruit Gardens, as the low grounds that form the banks of rivers; the alluvial soil of which they are generally composed, being an intermixture of the richest and most soluble parts of the neighbouring lands, with a portion of animal and vegetable matter, affords an inexhaustible fund of nourishment for the growth of fruit-trees, which derive from it such habits of health and vigour, that when sheltered by the higher grounds, which mostly accompany these flats, they set their bloom with a certainty, and ripen their fruit to a degree of perfection, that those in more exposed and less congenial situations rarely exhibit; to this, the mild and moist temperature diffused through the atmosphere by the neighbourhood of the water in no slight degree contributes, counteracting the late spring frosts and blighting winds that are so destructive to our fruit crops in the earlier part of the season.

As an instance how valuable such a situation may be rendered under Fruit-trees, there is a small piece of ground of this description, not exceeding three quarters of an acre, in this vicinity, which is leased at a rent of fifty guineas per annum, solely on account of its fruit. It is planted with Pear

and Apple-trees, some of them nearly two hundred years old; one of which, a Pear-tree, often produces twenty thousand saleable fruit in the season.

But these advantages are too frequently counteracted, and rendered of no avail, by the operation of the same cause as that from which they are derived, such grounds being generally liable to be inundated; and should the water lie long on them, it chills and sours the soil, and destroying the roots, the shoots canker, and the trees die off.

Having a piece of ground on the banks of the river Nore, near this city, thus favourably circumstanced, but not at the time liable to be injured by floods, I planted it with Fruit-trees, mostly Pears and Apples; subsequently the building of some mill-weirs in the river raised its waters above their usual level, and threw it back over my ground to such a height as frequently, in winter, to cover the surface, and render it a perfect quagmire. The trees in consequence cankered and ran rapidly to decay; banking out the water produced no good effect, as it always rose through the soil to the same level within as without, or higher, being absorbed by the surface. I also failed in an attempt to abate the nuisance by legal means; but being unwilling to abandon an object which had been of so much promise, I had at length recourse to an expedient, which proved effectual, and though obvious and simple, yet, as I am not aware of its having been before resorted to, I think that its communication may possibly be of some importance, as there are many thousand acres of land similarly circumstanced, and at present of comparatively low value, which if so treated, might be much more profitably converted to the purpose of Orcharding; and there are pro-

bably many other Orchards liable to such inundation, to which the same remedy may be successfully applied.

The trees in this Orchard having been planted in right lines, and at sufficient distances, I took the opportunity of a dry summer, to run between each row two deep and parallel trenches, and form a high bank in the intermediate space with the earth cast out, a small portion excepted, which was thrown about the stems of the old trees. On these banks, as they contained a sufficient body of soil, and were elevated above the reach of floods, I planted other Fruit Trees the ensuing season, which have since thriven with remarkable health and vigour, and bear abundantly.

This object effected, I turned my attention to the old trees, and at the first opportunity sank the trenches deeper, and raised the border about them with the mould thrown up; the vacuity formed by the trenches draining off the stagnant water from their roots into an open space, it the more readily evaporated, and what did remain, was rendered vital and wholesome by its impregnation with the air in contact, and instead of being injurious became rather beneficial, as it is from open water so impregnated, that plants absorb the oxygen or vital air necessary to the formation of carbonic acid (their principal food) by its combination with the carbon they hold in solution.

We have numerous proofs that the neighbourhood of water, not pent up but exposed to the air, is not injurious to trees. Some of the most productive and healthy vines I have seen, of all other plants one of the most impatient of stagnant water about its roots, bordered on a horse-pond. In this instance, the old Fruit Trees immediately made fresh

roots in every direction; they have since rarely failed to produce heavy crops, and are at this moment bending under their fruit.

Security from inundation, and the advantage of a deep rich soil, are not the only benefits that Fruit Trees derive from planting them on such sloping banks; the form of these banks also contributes mainly to insure success, as the roots of trees so planted, are always necessarily protruding to the surface, where they receive more immediately the direct influence of the air, rain, sun, and other agents conducive to vegetation, and are thereby the more perfectly enabled to form from the simple elements they absorb, those combinations which exhibit themselves to us, in such a wonderful variety of products.

Our industrious neighbours, the Dutch, have been long aware of the advantages such banks afford, and wherever the situation will admit, have planted the sloping sides of their dykes with Fruit Trees: this, the Scotch Horticultural Tourists notice,* remarking "That the Dutch have carefully planted Fruit-trees, especially Apples and Pears, on the western slope of their dykes, where they have become exuberant and fruitful trees; affording at this time both the most abundant crops and fruitful trees we have seen in Holland. The trees we pronounced to be the largest and finest in their kind we had yet seen in our journey, their horizontal branches extending gradually both up and down the declivity."

I have long observed that the most fruitful Orchards, and the most fertile, are those planted on a declivity, and the

* Journal of a Horticultural Tour through Flanders, Holland, &c. 1817, page 260.

steeper it is, if not quite a precipice, the more fertile they prove.

In preparing low alluvial grounds for the purpose of planting Orchards, the mounds or banks cast up should run parallel with the river, to impede the washing away of any of the soil; one or more cuts at right angles with the trenches should communicate with it to facilitate the drainage of the water; to these sluices may be attached, should circumstances require it. These banks should be raised if possible at least three or four feet above the highest water-mark, and be made eighteen feet broad at the base, and twelve at top; for this purpose, a cut of about fifteen or sixteen feet wide will be necessary, admitting the soil to be three or four feet deep, leaving a distance between each row of Fruit Trees of about thirty-three feet; but these proportions must depend on the depth of the soil. The Trees when at their full growth, will require a distance from each other in the lines of about thirty feet, but as they are likely to be soon productive, I would recommend planting them at first at half the distance, and removing every other tree afterwards, when they shall interfere so as to injure each other. The sides of such banks I have found to answer extremely well for Strawberries, on account of the convenience of water in a dry season.

This practice of raising banks to plant Fruit Trees on may, I think, be profitably carried to a further extent on those soils, whether clayey or sandy, which have not sufficient depth to support such trees in a healthy state; as a certainty of their success may in that case be insured, by accumulating the soil of the intervals in ridges or banks, should the object appear to justify the sacrifice of the intermediate spaces.

In the drainage of old Orchards, where the flooding is but light, running trenches between the rows may be found sufficient, by raising the level about the trees with the earth thrown out, as the roots checked in their progress downwards will rise into the soil laid over them, and elevate themselves above the reach of the water.

I remain,

Your very obedient servant,

JOHN ROBERTSON.

Killkenny,
August 17, 1826.

XIV. *On Dahlias. By* Mr. William Smith, *Under Gardener in the Arboretum Department of the Garden of the Horticultural Society at Chiswick.*

Read December 5, 1826.

It is not proposed to give in this Paper any statement respecting the history of the Dahlias, or to enter into details on the genus. All that is necessary, and indeed all that could be advanced on those points, has been already given by Mr. Sabine in the third Volume* of these Transactions, in his Paper which was read in October, 1818. It is only intended, at present, to describe the Double Varieties, those having now become almost the only objects of careful cultivation. Their number is so great, as to exceed what any one individual will ever desire to possess; a selection of the best sorts is therefore especially necessary. At the time when the Paper just referred to was published, the single varieties only were abundant, the number of double ones was very limited, but they rapidly increased, and have now nearly expelled the single ones from gardens of repute. The extension of sorts has however been limited to the Dahlia superflua; the varieties of Dahlia frustranea have but little multiplied, and no double flowers of that species have yet been produced. The brilliancy of the colours of the blossoms of the Dahlia frustranea, however, is such that it might have been expected

* See Horticultural Transactions, Vol. iii. p. 217.

it would have induced some practical Horticulturist to apply his skill to their improvement.

A few of the Double Dahlias which were raised at an early period still hold a place in the estimation of gardeners, but in general those of a few years standing have yielded their places to a younger progeny, which in their turn may be deprived of their station by fresh productions. In the progress of improvement, it may be hereafter a matter of curiosity to ascertain what was considered a good Dahlia at the present period; this, without a record such as this Paper will furnish, would be impossible. Thus we may indulge the hope that in drawing up descriptions of the best flowers of the present day, we are not only amusing contemporary readers, but securing information to futurity.

The collection of Double Dahlias in the Garden of the Horticultural Society at Chiswick has always been extensive. In the autumn of 1825, descriptions of those which were thought most worthy of record, were made by Mr. Joseph Paxton, then Under Gardener in the Arboretum Department, and now Gardener to His Grace the Duke of Devonshire, at Chatsworth, in Derbyshire. The publication of those descriptions having been deferred, in order to gain the experience of another season, the task of completing the Paper devolved upon me, as his successor. In addition to those which were described last year by Mr. Paxton, some varieties, not only of considerable excellence but with novelties of character, which were since added to the collection, have enabled me to make the classification more perfect. The number of the collection in the commencement of the present season considerably exceeded one hundred; this has

been very much reduced, by careful selection, and now amounts to sixty, whose names and characters are hereinafter given.

The collection was originally formed by small accessions from various friends of the Society, whose names, wherever their plants have been preserved, will be mentioned in the places where they are described. Additions from different persons have been also recently made, but the supplies of the greatest extent have come from the garden of Mr. ARIE CORNELIS VAN EEDEN, of Haarlem; from Mr. DAVID DOUGLAS, Gardener to Lady GRANTHAM, at Putney Hill, who has been fortunate in producing many excellent varieties; and from WILLIAM WELLS, Esq. of Redleaf, near Tonbridge, in Kent, whose peculiar success in raising some of the most valuable kinds I shall have occasion hereafter to notice. The Dutch collection of Mr. VAN EEDEN, having been obtained by means of his extensive connections from different countries, has been supposed to contain as many splendid varieties as are to be found in any other public nursery. The kinds obtained from the Putney Hill and the Redleaf gardens nearly all originated at those two places.

In making the descriptions, attention has been paid to the habit of the plant, as well as to the colour and disposition of the flower. With respect to the heights of the several varieties, those given are what they obtained in the Chiswick garden; in other soils and situations they may differ in this point, but they will probably preserve the relative proportion indicated by the heights here recorded.

Before I proceed to the descriptions, it will be necessary

to explain some of the terms used, to give the character of what is held to be a good flower, and also to explain the principles upon which the following classification is founded.

The appellation of *florets*, is applied in all cases to what have been improperly called the petals; they are strictly, and especially in single flowers, the *florets of the ray;* when there is any allusion to the short florets in the disk of the flowers, they are distinctly called the *florets of the disc*. The term *quilled*, in its strict sense, is applied to ligulate florets become tubular, but it is generally used to express a tendency only to that habit. In the descriptions, for the sake of discriminating the differences with greater accuracy, the terms *quilled*, and *half-quilled*, are used; but for the latter term, *somewhat quilled*, is not unfrequently substituted. The florets are said to be *reflexed*, when the whole are bent backwards exposing the disc. They are *recurved*, when they are turned backwards at the points. The *scales* are the bracteæ of the involucrum, and in single flowers, are situated behind the florets of the ray, one scale belonging to each floret; when the florets of the disc give way to, or are changed into florets resembling those of the ray, the scale accompanies the transmutation; so that in double flowers a series of scales is found behind every series of florets, and when these scales appear in the centre or disc, without being accompanied by ligulate florets, it is known, that although by some abortion they have not been produced, yet that whenever the plant blossoms perfectly, the flowers will be entirely double, that is, devoid of disc. These scales cannot be confounded with the small scales or

paleæ of the receptacle, the former being much larger, and generally dark green.

Description of a Good Double Dahlia.

The flower should be fully double, always filling the centre; the florets should be entire or nearly so, pointed or rounded, reflexed, and so forming a globular head, regular in their disposition, each series overlapping the other backwards; they may be either plain, or quilled, but never distorted;* if instead of being reflexed, the florets are recurved, the flower will be equally symmetrical. The peduncles ought to be sufficiently strong to keep the blossoms erect and consequently well exposed to view, and, long enough to show the flowers free of the leaves; if they are a little pendulous in the taller growing sorts, they will have a more elegant appearance. The plant ought to flower early and abundantly, and retain its characters until the end of the season. Bright and deep velvety colours are most admired.

As the tall sorts are in many respects objectionable on account of their coarse habit of growth, it is necessary to be more scrupulous in the selection of good varieties of them. As the dwarfs, on the other hand, possess advantages which the others do not, a greater licence may be assumed in preserving some of them in a collection. Flowers of dwarf varieties having large massive heads, but with a prominent yellow disc, if the colours are brilliant, are as much approved

* I do not wish by giving this character to condemn all the varieties that are not perfectly regular, there being many sorts which are much admired, that have no pretensions to regularity; and as the opinion of the beauty of any particular flower depends entirely upon the fancy of the person that beholds it, *ragged* and even *distorted* flowers may be regarded as beautiful by some, and ought not therefore to be excluded from a general collection.

as some of those which are more perfect or full; several of the prettiest flowers in the dwarf varieties are neither globular nor double, but are flat, with the florets decreasing in size towards the centre. For these desirable kinds of Dahlias, we are principally indebted to WILLIAM WELLS, Esq. His gardener, Mr. JOSEPH WELLS, possessing due knowledge of the qualities he wished his productions to possess, has succeeded in raising sorts, which combine dwarfness with early and abundant flowering, and produce blossoms of the most beautiful description; they begin flowering in June, when not above a foot high, and continue to blossom in constant succession till the autumn frosts divest them of their beauty. They seldom exceed three feet in height, and some are even more dwarf.

In point of colour, the Dahlia is remarkably variable, varieties being obtained from seed of a colour quite remote from that of the parent plant. Almost all the varieties lose the brightness exhibited in their early blossoms; some more rapidly than others; consequently plants least liable to this defect are particularly desirable. The flowers first produced in a season are always the most brilliant. Many also degenerate with age, being splendid when first raised, and becoming less beautiful in succeeding seasons. The tendency of the change in both these cases, is from bright to duller shades of colours, and towards purple, their original colour.

Until lately, no variety was known that did not possess a tinge of purple in its blossoms, and it was even doubted* whether a blossom entirely untinged with purple could be produced. The new scarlets are however perfectly pure. It

* Transactions of the Horticultural Society of London, Vol. iii. p. 230.

has been suggested to me that their colour may have been induced by cross impregnation with the high coloured varieties of the Dahlia frustranea. Some of the finest yellows are not always divested of a mixture in the colour, and the Dutch White, is the only white variety I have seen which is not tinged in a slight degree.

In the classification, the tall and dwarf kinds are separated, and form two subdivisions of the first class. This class comprises the varieties commonly known as Double Dahlias. These become double by a multiplication, or rather by a transposition of the florets of the ray, supplying the place of those of the disc, which in full double flowers is wanting, or entirely filled up. Another description of flowers has lately come under my notice, of which from their singularity I propose to form a second class. In this class the flowers assume a double appearance by a change in the florets of the disc, which become elongated and coloured, and are either tubular, or broken and ligulate, whilst in the circumference of the flower there is one row of radial florets, as in single flowers. Of this second class the descriptions for the present are deferred, because another year's observation will improve the descriptions of those already known, and will also furnish a greater extension of varieties in the class than my present knowledge affords. Each subdivision of the first class is divided into sections, according to the colours, and arranged in a natural series; taking purple as the centre and original colour, and white and yellow as the two extremes, receding on the one side through lilac towards white, and on the other through crimson and scarlet towards orange and yellow. As there has not been any direct approach towards white

through crimson or scarlet, no pale flowers which may not be arranged under lilac, have come under my notice, so that true roses and pinks are still wanting.

The following is the arrangement of the sections, which includes all the varieties herein described.*

1. White.
2. Lilac.
3. Light purple.
4. Dark purple.
5. Morone, or Dark purplish crimson.
6. Bright purplish crimson.
7. Light crimson.
8. Deep scarlet, or Blood red.
9. Pure scarlet.
10. Orange.
11. Buff.
12. Yellow.

In the accounts of the first production of the different varieties hereafter described, I have been necessarily very brief. The seedlings raised by Mr. Wells and Mr. Douglas, are marked by having their respective names prefixed; and the same plan is also followed with all the varieties raised in British gardens, where the first grower is known, or where their origin is not otherwise designated by their name. Of the history of those received from Mr. Van Eeden I am uninformed; any inquiry in order to obtain full information

* In selecting the sorts, whenever a section was found to be numerous, all the inferior flowers belonging to it were scrupulously rejected, and where inferior flowers have been retained in other sections, it is for want of better kinds in them.

about them would have been attended with more labour than the subject perhaps deserves. The origin of the whole is within a very few years, and those now described may either be worn out in as short a space of time, or in some cases cast by, even before the period of their natural decay, being excelled by superior novelties.

CLASS I. SUBDIVISION 1. TALL GROWING PLANTS.

SECTION 1. WHITE.

1. *Dutch White.* Received from Mr. VAN EEDEN. Flowers about three inches in diameter, seldom more than semi-double, pure white, greenish at the base of the florets; florets plain, notched at the points, irregular in their size and disposition. Stem light green; leaves light green; peduncles rather short. The plants grow from four to five feet high. Flowers rather early, but not abundantly.

2. *Agathe Royal*, or *Agate White*, came also from Mr. VAN EEDEN. Flowers about three inches in diameter, nearly double, white, tinged with lilac; florets not numerous, somewhat quilled, irregular. Stem light green; leaves light green; peduncles long. Plant grows weak and straggling about four or five feet high. Flowers late, and sparingly.

SECTION 2. LILAC.

3. *Grand Alexander.* Received from Mr. VAN EEDEN. Flowers about five inches in diameter, perfectly double, of a very pale lilac colour; florets narrow, notched at the points, frequently irregular; disc full of large scales. Stem and leaves dull light green; peduncles long. The plant grows rather bushy at top, and from four to five feet high. Flowers sparingly during the whole season.

4. *Agathe Imperial.* Received from Mr. VAN EEDEN. Flowers about three inches in diameter, very seldom full double, of a clear lilac colour; florets somewhat quilled, furrowed, notched at the points, regular in their disposition, and not reflexed; disc sometimes scaly. Stem hairy; leaves rather small, dark shining green; peduncles long. Plant grows from four to five feet high. Flowers abundantly and rather early.

5. *Lilac striped.* Came also from Mr. VAN EEDEN. Flowers from three to four inches in diameter, double, pale and dark lilac striped; florets half-quilled and recurved, those in the centre frequently curled; disc filled with scales, or

small florets. Stem light green; leaves light green; peduncles long, weak and pendulous. Plant grows about four feet high. Flowers rather early, and abundantly.

6. *Spring Grove Lilac.* Received from Mr. Isaac Oldaker, who raised it from seed in the garden of Sir Joseph Banks, at Spring Grove, in 1820. It was also received from Mr. Van Eeden with the name of *Lady Banks's Dahlia.* Flowers large, compact and double, about three inches in diameter, of a deep lilac colour, approaching to light purple; florets somewhat quilled, a little reflexed; disc scaly, hid by the florets. Stem brown; leaves dark shining green; peduncles long, stiff and erect. Plant grows from five to six feet high. Flowers early and freely.

Section 3. Light Purple.

7. *Ma Favorite.* Received from Mr. Van Eeden. Flowers about three inches in diameter, flat, compact, and generally full double, of a light purple velvet colour; florets notched at the points, somewhat quilled and regular in their disposition; disc scaly. Stem tinged with purple; leaves rough, and dark green. Plant grows from three to four feet high. Flowers early but not very abundantly.

8. *Speciosa. Speciosa, Light purple. Speciosissima.* Was received from Messrs. Young, of Epsom, who procured it in 1816, from Mr. John Edgar, the gardener to the late Mr. Barnett, of Ewell, in Surrey. It was also sent to the Society by Mr. Van Eeden. It is known by the above different names. Flowers large, globular and compact, fully double, of a mixed light purple colour; florets half-quilled and pointed, regular in their disposition, recurved, and covering the back of the flower; disc filled up. Stem, and leaves light green; peduncles long and pendulous. The plant grows erect, from five to six feet high. Flowers early and abundantly till the end of the season. A very elegant variety.

Section 4. Dark Purple.

9. *Changeable Purple.* Received from Mr. Van Eeden. Flowers large, not fully double, of a violet purple colour; florets large, somewhat quilled, deeply furrowed, veins on the under side of a much lighter colour; disc generally without scales. Stem brown; leaves large, light green; peduncles stiff. The plant grows erect, from four to five feet high. Flowers rather early and abundantly.

10. *Pulchra.* Received from Mr. Van Eeden. Flowers small, about two inches in diameter, of a violet and light purple mixed; florets small and some-

what quilled; striped on the back with light purple. Stem weak, tinged with purple; leaves dull green; peduncles rather weak. The plant grows from three to four feet high. Flowers early and freely.

11. WELLS's *Atropurpurea.* Flowers large, compact and double, of a clear dark purple colour; florets large, entire, and ovate at the points, those in the centre slightly quilled, regular in their disposition. Stem, and leaves light green; peduncles sufficiently long to show the flowers. The plant grows about four feet high, and very bushy. Flowers early, and tolerably freely.

12. DOUGLAS's *Royal Purple.* Flowers very large, nearly five inches in diameter, not fully double, of a fine dark purple approaching to morone; florets very large, somewhat quilled, a little reflexed, and mostly entire; disc large and scaly. Stem streaked with brownish purple; leaves large and rough; peduncles long. The plant grows luxuriantly, about five feet high. Flowers rather freely, but often imperfectly; it is notwithstanding a very beautiful variety.

13. *Purpurea nigra. Speciosa, Dark Purple.* Received from Mr. VAN EEDEN with both these names. Flowers large, from three to four inches in diameter, nearly globular, fully double, of a very dark velvety purple, deeply tinged with crimson; florets numerous, half quilled, recurved; disc filled up. Stem tinged with brown; leaves dull light green; peduncles long. The plant grows rather bushy, about five feet high. Flowers abundantly all the season. A good variety.

SECTION 5. MORONE, OR DARK PURPLISH CRIMSON.

14. *Morison.* Received from Mr. VAN EEDEN. Flowers about the middle size, compact and fully double, of a fine dark crimson velvet colour with a purple ground; florets narrow, half-quilled, and pointed, for the most part regular in their disposition. Stem tinged with a purplish hue; leaves small and dull green; peduncles sufficiently long to show the flowers. The plant grows bushy, about five feet high. Flowers freely, but not very early.

15. YOUNG's *Crimson.* Was sent to the Society by Messrs. YOUNG, of Epsom, by whom it was raised from seed in 1815. Flowers large, compact and fully double, of a dark morone velvet colour; florets regular in their disposition, somewhat quilled, rounded at the points, and nearly entire. Stem dark brown; leaves dark green; peduncles long and pendulous. The plant grows rather straggling, about five feet high. Flowers freely and early.

16. *Sabini.* Received from Dr. VAN MONS of Louvain, by whom it was raised, and named in compliment to Mr. SABINE. Flowers about the middle size, nearly

double, of a deep purplish crimson colour; florets entire, distorted, somewhat quilled and reflexed; centre florets frequently curled; disc without scales. Stem dark brown; leaves lightish green; peduncles long and erect. The plant grows low and bushy, about four feet high. Flowers early and abundantly.

17. Hetherington's *Warata'h.* Received from the late Thomas Wilson Hetherington, Esq. of Walthamstow. It was raised in his garden in the spring of 1823. Flowers large, but varying considerably in size, seldom full double, and frequently semi-double, of a deep crimson velvet colour; florets large, oblong and obtuse, very loose and irregular in their disposition, frequently mixed with a smaller set; disc bright yellow, without scales. Stem dark brown and hairy; leaves, dark shining green; peduncles long and pendulous. The plant grows about four feet high. Flowers very early and protusely. An elegant variety, and producing seed in abundance. The name which it has received is only applicable to its colour.

18. Douglas's *Chancellor.* Flowers large, from three to four inches in diameter, nearly full double, of a morone colour, the extremities of the florets inclining to purple; florets large and broad, furrowed, somewhat quilled and reflexed; disc scaly. Stem dark green, tinged with brownish purple; leaves smooth, dull light green; peduncles rather short. The plant grows about four feet high. Flowers abundantly, and rather early.

19. Douglas's *Superb Crimson.* Flowers from three to four inches in diameter, seldom full double, of a dark morone velvet colour with a purple ground; florets large, half-quilled, and nearly entire, regular in their disposition, and reflexed; disc yellow and scaly. Stem brownish; leaves large and rough, dark green; peduncles long. The plant grows from four to five feet high. Flowers abundantly and rather early.

20. Douglas's *Duchess of Gloucester.* Flowers above three inches in diameter, double, or nearly so, of a dark purplish crimson velvet colour; florets entire, somewhat quilled, regular, expanding, and reflexed; disc full of large green scales. Stem dark brown; leaves dull green. The plant grows about four feet high. Flowers abundantly, but not very early.

21. Douglas's *Marquis.* Flowers large, nearly double, of a dark morone velvet colour; florets half quilled, deeply cut at the points into two or three divisions, for the most part regular, and much reflexed; the disc when it is exposed, is scaly. Stem very dark; leaves large and rough, dull green; peduncles rather short. The plant grows about four feet high. Flowers abundantly, and early.

22. YOUNG's *Fimbriata*, called also YOUNG's *Monstrous Crimson*. Was received from ROBERT BARCLAY, Esq. of Bury Hill. It was raised from seed by Messrs. YOUNG, of Epsom, in 1816. Flowers large, very variable in their size, of a purplish velvet colour; florets laciniated, with smaller florets arising from within the tube of each floret, very irregular in size and disposition. Stem short and strong, much branched; leaves large and rough, coarsely serrated, and rarely compound. The plant grows low and bushy, from three to four feet high. Flowers sparingly and imperfectly, but at the end of the season more abundantly.

23. WELLS's *Crimson*. Flower from four to five inches in diameter, nearly full double, of a dark purplish crimson colour; florets somewhat quilled and notched at the points, more deeply coloured towards the base; disc with scales. Stem tinged with brownish purple; leaves smooth, and dark shining green; peduncles, long. The plant grows from four to five feet high. Flowers freely but not very early.

SECTION 6. BRIGHT PURPLISH CRIMSON.

24. DOUGLAS's *Beauty of England*. Flowers about three inches in diameter, nearly full double, of a very bright crimson with a purple ground; florets half-quilled, mostly entire, regular in their disposition, and decreasing in size towards the centre, purple on the under side; disc with scales. Stem brownish; leaves dark green; peduncles rather short. The plant grows from four to five feet high. Flowers freely, although not very early.

25. DOUGLAS's *Elegans*. Flowers about three inches in diameter, of a fine bright purple, highly tinged with crimson; florets few and irregular, broad, ovate and entire, more or less furrowed, frequently striped with morone, purple on the under side; disc mixed with large scales. Stem dark green tinged with purple; leaves with long petioles, rough, and dark green; peduncles short. The plant grows about four feet high. Flowers rather sparingly but tolerably early.

26. MILLER's *Royal Sovereign*. It was raised by Mr. JOHN MILLER, of Bristol, about 1820. The flowers when perfect are very magnificent; they are large, not fully double, of a light purplish crimson colour; florets large and loose, intermixed with small ligulate florets; disc small and close, filled up with large green scales. Stem very strong, of a purplish colour; leaves large and coarse; peduncles long. The plant grows about five feet high, and very luxuriantly. Flowers abundantly and rather early.

27. Douglas's *Ruby*, or *Rubioides*. Flowers large, from four to five inches in diameter, double, of a bright purplish crimson colour; florets large, ovate, furrowed, and generally entire, regular in their disposition, and reflexed; disc small and scaly. Stem dull green tinged with purple; leaves large, dull green; peduncles long and pendulous. The plant grows about five feet high, an flowers very abundantly. A very fine variety.

28. Lee's *Mutabilis*. Received from Mr. John Lee, of Hammersmith, in whose nursery it was raised in 1821. Flowers about four inches in diameter, double, of a changeable bright purple colour; florets somewhat quilled and entire, a little reflexed; disc scaly. Stem brownish; leaves large and coarse. The plant grows tall. Flowers abundantly, but not very early.

29. Miller's *Sans Rival*. Raised by Mr. John Miller, of Bristol, about 1821. Flowers about five inches in diameter, nearly double, of a very light crimson colour inclining to purple; florets large, generally flat and entire, reflexed, and sometimes irregular, but generally well arranged; disc small, and mixed with a few large scales. Stem tinged with purple; leaves large, dull green; peduncles long. The plant grows from five to six feet high. Flowers freely, but not very early. A very splendid variety.

Section 7. Light Crimson.

30. *L'Honneur d'Anvers*. This and the two following were received from Mr. Van Eeden. Flowers about the middle size, not fully double, of a mixed light crimson red colour; florets flat, half-quilled in the centre of the flower; disc with scales. Stem brownish; leaves a dark shining green; peduncles, sufficiently long to show the flowers well. The plant grows from four to five feet high, and bushy. Flowers freely, but not very early.

31. *Dodonæus*. Flowers large, compact and double, of a dull light red colour; florets half-quilled, and somewhat recurved, paler on the under surface, and marked with greenish veins; disc filled with scales, or with small florets. Stem light green, tinged with purple; leaves dark shining green; peduncles short. The plant grows erect, from four to five feet high. Flowers freely, but not very early.

32. *Princess Elizabeth*. Flowers about the middle size, very double and compact, of a bright crimson red colour; florets half-quilled, slightly notched at the points, a little reflexed, and regular in their disposition; disc scaly. Stem brown;

leaves dull light green; peduncles rather short. The plant grows from four to five feet high. Flowers early, but not very abundantly, until the end of the season, when plenty of blossoms are produced.

SECTION 8. DEEP SCARLET, OR BLOOD RED.

33. WELLS's *Insignis*, or *Rubra Pendula*. Flowers large, compact and double, from four to five inches in diameter, of a dark red colour inclining to crimson velvet; florets short and entire, half-quilled in the centre, recurved behind; disc large and scaly, or altogether filled up with florets. Stem brown; leaves large and broad, dark shining green; peduncles long and pendulous. The plant grows from four to five feet high. Flowers early, and abundantly towards the end of the season.

34. MILLER's *Beauté Suprème*. Raised by Mr. JOHN MILLER, of Bristol, about 1820. Flowers about four inches in diameter, nearly double, of a dark blood red colour approaching to crimson velvet, and sometimes striped with morone; florets long and narrow, half-quilled, and reflexed, covering the back of the flower; disc small and very prominent. Stem strong, tinged with purple; leaves small, dark green; peduncles long and pendulous. The plant grows from six to eight feet high. Flowers very well towards the end of the season. This is one of the most brilliant Dahlias cultivated.

35. MIDDLETON's *Sovereign*. Received from Mr. CHARLES MIDDLETON, of Norwich, by whom it was originally raised in 1823. Flowers large, about four inches in diameter, nearly double, of a fine deep scarlet velvet colour, the backs of the florets tinged with brownish purple; florets large and irregular, half-quilled, recurved, and deeply divided at the points; disc small, bright yellow, sometimes with, sometimes without scales. Stem brownish; leaves dull green; peduncles pendulous. The plant grows from five to six feet high. Flowers freely and rather early. It is hardy, not being so liable to be killed by frost so soon as some other kinds.

36. WELLS's *Eclipse*. Flowers large, compact and double, of a deep scarlet colour, not entirely divested of purple; florets regular in their disposition, and somewhat reflexed. Stem brownish; leaves dull light green. The plant grows from four to five feet high. Flowers early and freely in the beginning of the season.

37. WELLS's *Sunflower*. Flowers large and flat, about five inches in diameter, semidouble, of a deep rich scarlet velvet colour; florets large, broad and flat,

mostly entire; disc very large, about one inch in diameter, scaly. Stem very strong, dark brown; leaves large, and dark green; peduncles short and stiff. The plant grows from five to six feet high. Flowers abundantly and rather early. A singular variety; it received its name on account of the broad disc and broad radial florets of the flower.

Section 9. Pure Scarlet.

38. Wells's *Comet.* Flowers about three inches in diameter, nearly full double, of a fine deep pure scarlet velvet colour; florets regular, somewhat quilled, reflexed when in full flower, mostly entire, veins prominent on the under side; disc intermixed with small scales. Stem dark brown; leaves large, smooth, and dark shining green; peduncles short. The plant grows low and bushy, about four feet high. Flowers rather sparingly.

39. Wells's *Fulgida.* Flowers about four inches in diameter, semidouble, of a pure scarlet colour; florets irregular, oblong and generally entire, those in the centre sometimes curled; disc with scales. Stem brownish; leaves light green; peduncles, long. The plant grows about five feet high, and rather bushy. Flowers rather freely.

Section 10. Orange.

40. *Belvidere.* Received with the two following from Mr. Van Eeden. Flowers about three inches in diameter, perfectly double, of a dull reddish orange colour; florets sometimes quilled, generally half quilled, very regular and entire; disc small and scaly. Stem brownish; leaves a shining green; peduncles erect. The plant grows bushy, about five high. Flowers very early and most abundantly quite until the end of the season.

41. *Orange Flag.* Flowers large and double, about four inches in diameter, of a dark orange colour; florets large, irregular and reflexed. Stem short jointed, purplish; leaves light green. The plant grows about four feet high. Flowers sparingly and rather late.

42. *Koning Aza,* or *King Aza.* Flowers large and double, of a fine rich orange colour tinged with red; florets thin, irregular, half quilled, and recurved, narrow, oblong, and a little cut at the points; disc filled up, or scaly. Stem dark green; leaves large, coarse, and very dark green; peduncles long and erect. The plant grows about five feet high. Flowers rather sparingly and late. A very singular variety.

SECTION 11. BUFF.

43. WELLS's *Fawn-coloured.* Flowers about five inches in diameter, compact and double, of a buff and orange mixed, slightly tinged with purple; florets very numerous, the outer reflexed, and the inner half quilled; disc with scales. Stem dark brown; leaves large and coarse, light shining green. The plant grows bushy, from four to five feet high. Flowers early and freely.

44. *Royal Olive.* Received from Mr. VAN EEDEN. Flowers about four inches in diameter, double, of a changeable buff and orange, striped; florets half quilled and reflexed, rather irregular; disc with scales. Stem brownish; leaves dark shining green; peduncles long erect. The plant grows erect, from four to five feet high. Flowers profusely towards the end of the season.

45. *Camelliæflora. Aurea Nankin.* Received from the late Mr. JAMES LEE, of Hammersmith, who procured it in 1818, from Mr. VAN EEDEN, under the name of Aurea Nankin. Flowers large, very compact and double, of a light buff colour; florets regular, half quilled and reflexed, forming a globular flower. Stem dark brown; leaves small, dark shining green; peduncles long. The plant grows erect, from four to five feet high. Flowers early and very abundantly during the whole season.

46. *Henriette.* Received from Mr. VAN EEDEN. Flowers about three inches in diameter, double, of a mixed colour, the outer series of florets a reddish orange, the inner a bright yellow tinged with red; florets somewhat quilled, but rather crumpled. Stem light green and hairy; leaves small, smooth, a shining green; peduncles long. The plant grows from four to five feet high. Flowers rather late.

SECTION 12. YELLOW.

47. *Sulphurea Grandiflora.* Received from the late Mr. JAMES LEE, who imported it in 1818, from Mr. VAN EEDEN. Flowers from four to five inches in diameter, double, often semidouble, colour varying from light buff to clear sulphur yellow, tinged with buff on the extremities; florets for the most part regular, somewhat quilled, and entire; disc with scales. Stem, and leaves light green; peduncles sufficiently long to shew the flowers. The plant grows bushy, about four feet high. Flowers well towards the end of the season.

48. *Luteola.* Received from Mr. VAN EEDEN. Flowers about the middle size, compact and double, of a clear bright sulphur colour; florets narrow, somewhat quilled and recurved; disc with scales. Stem, and leaves dark shining

green. The plant grows erect, from four to five feet high. Flowers early and very abundantly.

49. *Sulphurea Speciosa.* From Mr. Van Eeden. Flowers about the middle size, nearly double, of a clear bright sulphur colour; florets broader than in the preceding variety (which it resembles), regular, somewhat quilled and recurved; disc, with scales. Stem, and leaves light green. The plant grows from four to five feet high. Flowers early and in abundance.

50. Miller's *Straw-coloured, Clifton Yellow,* or *Bristol Yellow.* Raised by Mr. John Miller, of Bristol, about 1818. Flowers large and double, about four inches in diameter, of a fine bright yellow colour; florets small and narrow, somewhat quilled in the centre, and recurved at the back; disc with scales. Stem light green; leaves large dark green; peduncles long. The plant grows from five to six feet high. Flowers freely but rather late.

Class I. Subdivision II. Dwarfs.

Section 3.* Light Purple.

51. Wells's *Floribunda.* Flowers about the middle size, colour mixed, the base of the florets being dark, and the extremities light purple; florets rather irregular, somewhat quilled; disc without scales. Stem dark brown; leaves dull green; peduncles long, erect. The plant grows from two to three and a half feet high. Flowers early and profusely.

Section 5. Morone, or Dark Purplish Crimson.

52. Wells's *Victory.* Flowers about three inches in diameter, very compact and nearly full double, of a deep crimson colour, slightly tinged with purple; florets large, reflexed, slightly notched, sometimes entire, somewhat quilled in the centre; disc bright yellow. Stem purplish; leaves small, light green. The plant grows low and bushy, from two to two and a half feet high. Flowers early and very abundantly.

53. Wells's *Sanguinea.* Flowers about the middle size, semidouble, flat and compact, of a very dark morone velvet colour, with very little purple; florets

* We have not at present Dwarf Dahlias of sufficient variety of colour to furnish examples for every section. The following sorts are wanting to complete the classification: Whites, Lilacs, Dark Purples, Light Crimsons, Deep Scarlets, Pure Scarlets, and Oranges.

short and ovate, a little quilled, decreasing in size towards the centre, frequently becoming curled, and surrounding the bright yellow disc. Stem tinged with purple; leaves smooth, dark green and shining; peduncles short and stiff. The plant grows from one and a half to two and a half feet high. Flowers abundantly and early.

54. WELLS's *Princess Alexandrina Victoria.* Flowers about two and a half inches in circumference, of a dark purplish crimson colour; florets regular in their disposition, somewhat quilled, rounded and entire at the points, sometimes a little reflexed; disc brownish, intermixed with small scales. Stem brownish; leaves small, smooth and soft, dark shining green. The plant grows from two and a half to three feet high. Flowers early and abundantly.

SECTION 6. BRIGHT PURPLISH CRIMSON.

55. WELLS's *Bright Purple.* Flowers rather small, from two to two and a half inches in diameter, semidouble, of a bright purplish crimson colour; florets rather irregular, half quilled, nearly entire; disc bright yellow, with small scales. Stem tinged with purple; leaves short, dark green; peduncles long. The plant grows about three feet high. Flowers abundantly and very early.

56. WELLS's *Floribunda Nana.* Flowers small, semidouble, of a bright crimson, fading to purple towards the extremity of the florets; florets half quilled, more or less notched at the points, of different sizes, irregular in their disposition, and curled in the centre; disc small and scaly. Stem dark brown; leaves small, dark green; peduncles rather short. The plant grows from one foot to one foot and a half high. F owers very early and abundantly. This is the dwarfest of all the Dahlias with which I am acquainted; it begins flowering before it is nine inches high.

57. WELLS's *Excellent*, commonly called *Rose-coloured.* Flowers large and double, about four inches in diameter, of a clear light purplish crimson colour; florets half-quilled and reflexed; disc yellow, small, and scaly. Stem brownish; leaves dull green; peduncles pendulous. The plant grows about three feet high. Flowers early and abundantly.

SECTION 11. BUFF.

58. WELLS's *Gris de-lin.* Flowers large, about four inches in diameter, compact and rather flat, not fully double, of a rich buff velvet colour tinged with pink; florets broad, a little inflexed at the edges, generally entire; disc sur-

rounded by small brownish-coloured florets, which afterwards expand and leave a few curled in the centre. Stem brownish; leaves dark green. The plant grows from three to three and a half feet high. Flowers early and very abundantly.

59. *Tendre Agathe.* Received from Mr. Van Eeden. Flowers about the middle size, double, of a reddish pale buff colour with a yellow ground; florets somewhat quilled, irregular and reflexed; disc without scales. Stem very dark brown; leaves small, dark green. The plant grows from three to four feet high. Flowers abundantly during the most of the season.

Section 12. Yellow.

60. Wells's *Dwarf Yellow.* Flowers large and massy, about four inches in diameter, nearly full double, of a fine rich yellow, tinged with buff in the centre; florets very numerous, somewhat quilled and furrowed, cut at the points, and reflexed. Stem dark green; leaves small, light green; peduncles long and pendulous. The plant grows about three feet high. Flowers early and very abundantly.

The collection of Double Dahlias which I have now described, may certainly be considered as one of the best existing. The rejection of many kinds has made it very select, and the addition of the dwarf varieties, has given it a character which is almost new. During the last flowering season, I examined several newly raised flowers of great excellence, which it will be necessary hereafter to add to those above described; but as my account was necessarily limited to those cultivated in the Garden of the Society, descriptions of others could not form a part of it.

Respecting the cultivation of Dahlias, there is little new to offer. Some good directions on that subject may be found in Mr. Sabine's Paper in these Transactions already referred to. The following is the present method of treating them in the Garden of the Society at Chiswick.

In the latter end of the season when the frosts have

destroyed their stems, and before winter sets in, the roots are taken up, and after being cleaned of the earth that adheres to them, are exposed in the open air to dry; they are then placed in their winter quarters, in the following manner. A dry spot is chosen, upon which is placed a layer of straw, three inches thick; the roots are piled in a heap upon this, and covered with a layer of straw the same as below, and above the whole is placed a covering of earth eighteen inches thick, beaten firmly. In digging out the earth for this purpose a trench is formed round the heap, which acts as a drain to draw off the wet.*

The roots are taken out in March and potted; they are then placed in a pit heated with dung; after they have grown a certain length they are allowed as much air as possible, merely receiving protection from cold, and the night frosts. They are planted out when there is no longer any danger to be apprehended from the weather. It is customary to place them in clumps, or in single rows; a very good example of the effect produced by an avenue of Dahlias was shown in the Garden of the Society, during the last season; a row consisting of all the varieties was planted on each side of a long walk, corresponding plants, that is, the same varieties, being placed on each side, opposite to each other.

In a clump of Dahlias planted in the Arboretum, an attempt was made to give the tall growing sorts a dwarf appearance. This was effected by pegging down all the young shoots as fast as they grew, till the ground was nearly covered. The shoots

* This method is not to be preferred when there is sufficient room for keeping the roots during winter in a house, for they are liable to be injured by damp, when pitted as above described.

were then suffered to grow upright, and the whole became one mass. They flowered extremely well, but rather late in the season, and never had the appearance of being higher than two or two feet and a half. The sorts selected for this experiment were those that flower most abundantly. Large rooted plants which produce many stems are best suited for this purpose, because such sooner fill up the intervening spaces.

The dwarf kinds ought always to be planted either by themselves, or in front of the taller ones. When planted in clumps, the effect produced by them is very brilliant.

It has been found that Dahlias do not succeed well when placed more than once on the same ground, and that if it is desirable to have them always in one situation, it is necessary to renew the soil, by trenching it deeply the second, and taking it out and replacing it the third and succeeding years. It will seldom be found advisable to add manure; fresh soil is all that is necessary. When the plants are much exposed, they require to be supported by strong stakes; these should be put in at the time of planting, or shortly afterwards; for if this work be done later, the roots will be injured by the stakes in driving them down; this hurts the plants when advanced materially, sometimes even killing them.

In potting the roots in spring, it is recommended to divide them as much as possible, (always taking care to retain a part of the stem to each root,) excepting the plants intended to be laid down. To secure young plants for the next year's stock, as the most likely means of preserving the kind in its true character, they should be propagated from cuttings taken from the old roots. An excellent method of preserving small

or young plants during the winter, is to keep them the whole summer in the pots, in which they are first struck, plunging them out in the borders. When taken up in the autumn they are still to be retained in the pots, which being cleaned and dried, may be stored in a cellar or other place into which the frost will not penetrate. The roots thus treated, when taken out in the spring, are in excellent condition, and the earth being shaken off them, they are to be re-potted in the same manner as is usual for older roots.

The method of propagating Double Dahlias by engrafting them upon the roots of single kinds, as described by Mr. THOMAS BLAKE, in the fourth Volume of these Transactions, page 476, is not now much practised, it being found more convenient to propagate them from cuttings, which, if properly managed, produce plants equally vigorous, with less trouble.

List of the Names of Dahlias described in this Paper.

	No.
Agathe, Imperial	4
Agathe, Royal	2
Atropurpurea	11
Aurea Nankin	45
Beauty of England	24
Beauté Suprème	34
Belvidere	40
Bright Purple	55
Camelliæflora	45
Chancellor	18
Changeable Purple	9
Comet	38
Crimson (Wells's)	23
Crimson (Young's)	15
Crimson, Monstrous	22
Dodonæus	31
Dutchess of Gloucester	20
Elegans	25
Eclipse	36
Excellent	57
Fawn-coloured	43
Fimbriata	22
Floribunda	51
Floribunda Nana	56
Fulgida	39
Grand Alexander	3
Gris-de-lin	58
Henriette	46
Insignis	33
Koning Aza	42
Lady Banks	6
L'Honneur d'Anvers	30
Lilac Striped	5
Luteola	48
Ma Favorite	7
Marquis	21
Morison	14
Mutabilis	28
Orange Flag	41
Princess Alexandrina Victoria	54
Princess Elizabeth	32
Pulchra	10
Purpurea Nigra	13
Royal Olive	44
Royal Purple	12
Royal Sovereign	26
Rose-coloured	57
Ruby	27
Rubioides	27
Rubra Pendula	33
Sabini	16
Sanguinea	53
Sans Rival	29
Sovereign	35
Speciosa	8
Speciosissima	8
Speciosa, Light Purple	8
Speciosa, Dark Purple	13
Spring Grove Lilac	6
Straw-coloured	50
Sulphurea Grandiflora	47
Sulphurea Speciosa	49
Sun Flower	37
Superb Crimson	19
Tendre Agathe	59
Victory	52
Warata'h	17
White, Agate	2
White, Dutch	1
Yellow, Bristol	50
Yellow, Clifton	50
Yellow, Dwarf	60

POSTSCRIPT.

Since the above Paper was drawn up, two publications, in which descriptions or arrangements of Dahlias are given, have come under my notice. These are, the Manuel Complet du Jardinier, published in 1826; and the Bon Jardinier for 1827. On both of these I have a few observations to make.

The Manuel Complet du Jardinier, is from the pen of M. LOUIS NOISETTE, of Paris. He has given * short descriptions of eighty Dahlias, a few being single, the rest double varieties; and added the names of twenty-seven others, making the amount of his collection one hundred and seven. The descriptions are too brief to enable me to identify any of them with those which are above noticed, and their names, with a few exceptions, are different from those used by the Dutch and English Gardeners.

In the Bon Jardinier for 1827, M. POITEAU, the Editor, has given, at the commencement of the volume, in his Revue Horticole, page 40, a full arrangement of Dahlias, with complete descriptions of one hundred and fifteen sorts. The names adopted by him are in part those used by M. NOISETTE, in a few cases they have been altered. The arrangement is almost the same as mine, as will appear by the following comparison of the respective classifications. His Divisions,† which are here enumerated, accord with my Sections. The

* Manuel Complet du Jardinier, Tom. iv. Part 1, page 101.

† In the work the first three are entitled Divisions, the remainder Sections.

separation into Classes of the tall and dwarf kinds is not used by M. POITEAU.

1. Fleurs Blanches ou à fond blanc.
2. ——— Lilas.
3. ——— Roses.
4. ——— Violettes.
5. ——— Pourpres.
6. ——— Amaranthes.
7. ——— Rouges.
8. ——— Coccinées.
9. ——— Ponceaux.
10. ——— Jaunes nuancés.
11. ——— Jaunes pures.

The 1st, Blanches, and 2nd, Lilas, are the same as my Whites and Lilacs. The 3d, Roses, would be divided between the Light Purples and Bright Purple Crimsons; there being, as I think, no true Rose flowers, at least as far as I have seen. The 4th, Violettes; 5th, Pourpres; and 6th, Amaranthes, agree with my Light Purples, Dark Purples, and Morones. The 7th, Rouges, are my Light Crimsons. The 8th, Coccinées; and 9th, Ponceaux, are to be referred to my Pure Scarlets and Deep Scarlets respectively. My Oranges appear to be mixed with the Ponceaux. The 10th, Jaunes nuancés are my Buffs; and the 11th, Jaunes pures, my Yellows.

The greater number of the sorts described by M. POITEAU are perhaps strangers in our gardens. On the merits of the collection, a decided judgment ought not to be given without an actual inspection of the flowers. M. POITEAU has not explained what is considered in France a good flower, but from his descriptions, I am inclined to think that several

varieties of his are much inferior to those generally grown in the best English gardens; but there are certainly among them many very fine flowers, which when obtained, will essentially improve our collections.

XV. *On the Cultivation of Camellias in an open Border. In a Letter to the Secretary.* *By Mr.* Joseph Harrison.

Read February 20, 1827.

Sir,

The varieties of Camellia Japonica, which I have been successful in acclimating at this place, are, 1st, The Double Red. 2nd, The Double White, and, 3rd, The Double Striped. The following detail contains the mode of treatment I have pursued.

The situation where the plants grow is open to the south and south-east. Up to the year 1824, it was rather exposed to the west and north, but since that period it has been well screened by the erection of buildings in those directions. The soil in which the plants grow, is a brown loam upon a rocky substratum. The face of the substratum is level, but the surface of the border is much inclined; the depth of the soil is two feet at the front, and four feet at the back of the border.

Previously to planting out in the open air the plants were in pots, and had been kept in a green-house. At the time of turning out the plants, each was two feet high; they were also strong; and in previous years the leading shoots had been several times stopped, in order to make the plants bushy. This attention to the shoots appears to be of importance, for I have turned out several other large Camellia plants which were not bushy, but never could keep them alive for more than two years afterwards. I have also turned

out nearly fifty others, each about one foot high, but I never could get them to survive long. From these circumstances I am convinced, that unless the plants be strong and bushy, and well supplied with roots, they will not be able to resist the cold in winter, certainly not in this northern part of the kingdom.

In July, 1819, single plants of the above-mentioned three kinds were planted out with their balls entire; the fibrous roots around the outside of the balls were gently loosened by the hand, and as far as practicable placed in direct lines from each bole, so that upon pushing forward they immediately entered into the soil of the border. I have uniformly found the process of loosening the roots, to promote very essentially the early establishment and future progress of all plants, that had been grown in pots previously to turning out. After the holes were opened for the reception of the plants, I mixed with the soil at the bottom and sides, a good portion of well rotted cow-dung. The top of each ball of earth was placed so low that when the soil of the border was levelled, it was four inches below the surface. After gently pressing the soil around the ball of roots, each plant was well watered with drainings from the dung-hill; this watering was repeated several times during the summer. The stems were, from the first, well secured to prevent their being loosened by the wind.

At the end of the following October, I laid over the roots of each plant, to the extent of two feet from the stem, some old spent bark, to the depth of eight inches, and afterwards placed around each a wooden frame the height of the plant, and open at the top. Upon this in severe weather a hand-glass was placed, and in very hard frosts the whole was

covered at night with a mat. I took off the glass when the weather was mild.

At the end of April, 1820, I removed the frame and glass, and in May the old bark, in order more freely to admit the influence of the sun and rain to the roots. At the approach of winter, 1820, I replaced the spent bark and the frame, and used the glass and mat in hard frosts, as before. In the winter of 1821, I again protected the roots, and used the frame and glass, but no mat. Since that time I have not protected the plants with any thing over their tops, except during heavy snows to prevent their being broken; but at the approach of each succeeding winter, I covered the roots to the extent of three feet from the stem of each plant, with old decayed leaves, or spent bark, to the depth of ten inches, but removed this covering in the following spring.

The plants are now vigorous and grow very freely; they have blossomed every spring from the middle of April to June, and last year the striped and red varieties had about three hundred blossoms upon each bush. The white variety does not grow so freely nor bloom so abundantly as the other kinds.

It sometimes happens that at the time when the blossoms are expanded, there are a few frosty nights, and if the frost operates strongly on the flowers it turns the petals brown, but when frost is apprehended I place the frames and glasses over the plants, as in winter; this prevents the bloom from being injured.

I am, Sir,

Your very obedient Servant,

JOSEPH HARRISON.

Wortley Hall,
January 30, 1827.

POSTSCRIPT.

March 12, 1827.—Since the time of transmitting the above account, the frost has been more severe at this place than at any period since the Camellias were turned out; but they have not suffered in the least, though the Common Laurels in the same situation have been much injured.

XVI. *A Method of growing Crops of Melons on open Borders.* *In a Letter to the Secretary.* *By Mr.* WILLIAM GREENSHIELDS, *F.H.S. Gardener to* RICHARD BENYON DE BEAUVOIR, Esq. *F.H.S. at Englefield House, in Berkshire.*

Read February 6, 1827.

SIR,

BEING convinced by experience that the later crops of Melons may be raised and brought to perfection, in ordinary seasons, with considerably less expense and trouble than the general practice admits of, I send you a brief description of the method I have pursued with success.

About the middle of March, the seeds for the first out-door crop are sown, and placed in a cucumber or other frame, where there is a tolerable heat. They are potted and treated in the usual way, till the final planting out.

The first or second week in May, I prepare a bed on a south or south-west border, by throwing out the mould one foot deep and four feet wide, filling up the trench to half its depth with the stems and leaves of any vegetables that require clearing off from the quarters of the kitchen garden. The remaining half is made up with the exhausted linings of cucumber frames or pits, which I consider better for the roots of the plants to run in, than fresh dung from the stable-yard.

The bed when the materials are put in, has an elevation of one foot towards the back or wall side, and is firmly trodden down with the feet. The mould that was taken out is

returned upon the bed to the depth of nine inches, and has a similar treatment, as regards treading. When the preparation is finished I set on the hand-lights, four feet apart, along the centre of the bed, and plant a pot of plants under each light. Two or three plants will be sufficient for each light. When they are planted I give a good watering, and shut the lights close down, and let them remain so till the plants have nearly filled them, when they should be tilted up about two inches in front every fine day for a week or ten days. If the weather is dry and warm I give gentle watering, but if dull or cold the plants are better without it.

If the hand-lights have ventilators at top, they will be better calculated for the purpose; these may be opened to give air instead of lifting the light; this will let the damp air escape, and prevent the sun's heat from scorching the tops of the vines and leaves, which is apt to be the case if they are suffered to remain in contact with damp air, when so exposed.

When the plants have nearly reached the top of the lights, or appear to get crowded with vines, the lights should be raised up and the plants let to grow out, in the same manner as is practised with Ridge Cucumbers. If the vines are very thick, a few of the weakest may be pinched off, and the top of each leading shoot or vine removed. No more pruning will be necessary for the season. Previously to the lights being raised, the bed should be covered over with a layer of short grass, or any dry litter that may be most convenient, to keep the vines and fruit clean. Setting the fruit at this season of the year is quite unnecessary.

If the weather is hot and dry, frequent waterings will be required; but it will be better to give water in tolerable quantities once or twice a week, than oftener and in less quantity, for Melon plants are impatient of much moisture on their vines or leaves, being very apt to canker from it. To have handsome fruit, it will be necessary to thin them when they get to the size of walnuts, as they set very freely, often several dozens on a hill. The fruit will begin to ripen about the first week in August, and continue to be produced through that month and part of September. All waterings should terminate when the fruit begins to ripen, since the roots of the plants running amongst the decomposed vegetables will afford sufficient nourishment to the later fruits. To prolong the season, seeds may be sown three weeks later, and planted out by the same rule, and treated in every respect as above, till there is an appearance of frosty nights, when they may be protected by common cucumber or melon-lights, as is done with the early crops. By this means tolerably good Melons may be had till the end of October.

The sorts grown by the above treatment were the Black Rocks, Scarlet Rocks, Green fleshed, Netted, and Early Cantaloup Melons.

I am Sir,

Your most obedient Servant,

WILLIAM GREENSHIELDS.

Englefield, near Reading,
January 4, 1827.

XVII. *Notice of Five Varieties of Pears, received from Jersey in the year* 1826. *By Mr.* John Lindley, *F.L.S. &c. Assistant Secretary for the Garden.*

Read December, 19, 1826.

The unusually fine summer that has been lately experienced in this kingdom has had a powerful effect upon most of the productions of our soil, and especially upon the fruits which serve for winter store. But perhaps its agency has been shewn more conspicuously in the excellence to which it has brought our Pears, than in its effect upon any other description of fruit. In the favoured climate of Jersey, this has been more distinctly perceived; and the Pears produced in that Island, which, as is well known, have always been celebrated, have this year arrived at a state of beauty and excellence of flavour, of which they had scarcely been supposed to be susceptible.

A more favourable opportunity cannot be expected to occur, for giving an account of some of the best varieties cultivated in Jersey; and as sufficient means have been furnished, by liberal supplies of specimens from Captain Le Couteur, and Mr. Peter Langelier, both resident in the Island, and valuable correspondents of the Society, I gladly avail myself of the means thus afforded of laying a brief account of a few of them before the Society. In doing this, I shall confine my remarks to five kinds, which proved to be of such first-rate excellence, as to deserve general cul-

tivation; being of opinion that our lists are already sufficiently provided with varieties of inferior quality.

Those to which I propose to call attention, are,

1. Marie Louise.
2. Duchesse d'Angoulême.
3. Doyenné gris.
4. Doyenné panaché.
5. Beurré d'Aremberg.

1. *Marie Louise.*

The high character which this variety has received in the Transactions of the Society, Vol. iv. page 519, plate 20, has been fully confirmed by the specimens received in the present season. Those from Jersey were much longer and yellower than is represented in the figure referred to, which is a faithful likeness of the variety, in the state in which it was produced this year upon a standard tree in the garden of JOHN MOTTEUX, Esq. at Beechamwell, in Norfolk. There is no doubt that this Pear will soon become as generally cultivated as it deserves.

2. *Duchesse d'Angoulême.*

This was sent, for the first time, some years since by M. NOISETTE from Paris, and also in 1825, by Mr. PETER LANGELIER, from Jersey. It is of a roundish oblong figure, tapering towards the stalk, with an extremely uneven knobby surface. Both the eye and stalk are deeply sunk in an irregular cavity, the stalk being about one fifth the length of the fruit, which generally measures about three inches and a half each way, but sometimes acquires a much greater size. The skin is pale yellow, copiously and regularly spotted with broad russet

Duchesse d'Angoulême Pear.

marks. The flesh is yellow, quite melting, and most agreeably perfumed.

This is not only a variety of the first excellence, but it is perfectly distinct from all other Pears. Its unusually knobby uneven surface, and the broad distinct brown spots of the skin, are peculiar to itself. It is generally in perfection during November and December, but this year it was past before the end of October. The annexed figure has been taken from a fine specimen received from Mr. LANGELIER.

3. *Doyenné gris.*

This has already been described and figured in the 5th Volume of the Society's Transactions, page 136, plate 2, fig. 1. Its rank is among the very best of the melting Pears, that ripen from the middle of October till the end of November. The Jersey specimens, received from Mr. LANGELIER, were in a few instances tinged on the sunny side with a bright fiery red; in this country, and in the fruit received from Paris, they were of the dull cinnamon colour, shewn in the plate above referred to.

4. *Doyenné panaché.*

Of this variety I find no mention in any printed work. Fruit in a ripe state were received from Mr. LANGELIER, and tasted on the 12th of October. In form, it is the same as the *Doyenné gris*, or perhaps tapers a little more towards the stalk. Its colour is a bright clear yellow, faintly striped with green and red; it is also speckled all over with small russet brown dots. The flesh is white, melting, sweet, and very

agreeable, but it is not so high-flavoured as the *Doyenné gris*, than which it is a better keeper.

5. *Beurré d'Aremberg.*

The history of the origin of this delicious variety, has been already given in the 5th Volume of the Transactions, page 406, but at that time too little was known of its merits; subsequent experience, and especially an examination of the fruit produced in the present season, justifying its being placed at the head of all the Pears in cultivation. Numerous specimens were received from Mr. LANGELIER, ripe in October; and others were sent by Captain LE COUTEUR, which were in perfection at the end of November; but those ripened in less favourable summers than the last, will keep till February. The fruit is strictly turbinate, on an average three inches and a half long, and two inches and three quarters wide at the broadest part, the stalk measuring one inch in length. Towards the stalk the figure is slightly contracted. The skin is of a pale delicate green, very slightly dotted with russet, and becomes occasionally deep yellow at maturity, but then it is past its best. The flesh is whitish, firm, very juicy, dissolves in the mouth, and is wholly destitute of grittiness; it is sweet, rich, and so peculiarly high-flavoured, that I know no Pear which can be compared with it in that respect. One of the figures in the annexed plate, represents the fruit in the state in which it must be considered to be in perfection if gathered from walls. Specimens sent by Captain LE COUTEUR were much more russety, with a yellower ground colour, which was much mottled with broken bright green.

1

2

1 Beurré d'Aremberg Pear

2 Glout-Morceaux Pear

As this Pear possesses merit of such a high degree, it is important that no other variety should be confounded with it, and yet I fear this will be found to have happened to a considerable extent. In the 5th Volume of the Transactions, Appendix, page 6, among the Flemish Pears described by M. PARMENTIER, is one called the *Gloux Morceaux*,* which is extremely similar to the *Beurré d'Aremberg*, and which I believe has already been sent into cultivation under that name. It may however be distinguished by its larger size, greater irregularity of outline, especially about its thickest part, by its later period of ripening, and, although undoubtedly a Pear of great excellence, by its firmer, more gritty, and less highly flavoured flesh. For the sake of contrasting this with the *Beurré d'Aremberg*, a figure of it, taken from specimens ripened in the garden of ANDREW ARCEDECKNE, Esq. at Glevering Hall, in Suffolk, is engraved upon the same plate. So much larger is the *Gloux Morceaux* than the *Beurré d'Aremberg*, that while the largest Jersey specimens of the latter did not measure more than three inches and a half by three inches, the Suffolk specimens of the former were, on an average, four inches long and three inches and a half broad.

* M. DUMORTIER RUTTEAU, of Tournay, in a letter recently received from him, asserts that the proper orthography of this name is *Glout Morceau*.

XVIII. *Upon the Culture of the Prunus Pseudo-Cerasus*, or *Chinese Cherry.* *By* THOMAS ANDREW KNIGHT, *Esq. F.R.S. &c. President.*

Read February 20, 1827.

THE Prunus Pseudo-Cerasus, or Chinese Cherry, has been so recently* introduced into Europe, and has been hitherto so little propagated, or cultivated, that probably not even its name is known to the greater number of gardeners. It has however properties and qualities, which will render it an acquisition of considerable value; and I am perfectly confident that it has not yet been seen, in this country, nearly in the greatest state of excellence, which it is capable of

* This Cherry was introduced from China by Mr. SAMUEL BROOKES, of Ball's Pond, in 1819, and he presented a plant of it in 1822, to the Horticultural Society. It has since, in two instances, been imported from China by the Society, through the assistance of Mr. REEVES. In the year 1824, it produced a crop of fruit in one of the houses in the Chiswick Garden, which ripened within fifty days from the time the blossoms opened. In that year, a figure of the plant in flower was published by Mr. BELLENDEN KER, in the Botanical Register, tab. 800, with the name of Prunus paniculata, under the impression that it was the species so named by THUNBERG. It received its present name of Prunus Pseudo-Cerasus, from Mr. LINDLEY, in his Report on the New and Rare Plants, (see Horticultural Transactions, Vol. iv. page 90) which had flowered in the Garden at Chiswick, previous to March, 1824. It is readily distinguished as a distinct species from the Common Cherry and the Morello Cherry, by its bearing its flowers in racemes, and by the peduncles being hairy. It is known in China by the name of Yung Fo, but is only cultivated as an ornamental plant at Canton, where it rarely produces fruit.

acquiring. I have therefore addressed to the Horticultural Society, the following observations upon the propagation and culture of it, believing that I am better acquainted with the means of propagating it than any other person is, though I am sensible that I am but ill prepared to execute the task which I have undertaken.

I received a plant of the Chinese Cherry from the Garden of the Horticultural Society in the summer of 1824, after it had produced its crop of fruit; and it was preserved under glass, and subjected to a slight degree of artificial heat till the autumn of that year. It appeared very little disposed to grow; but produced one young shoot, which afforded me a couple of buds, for insertion in stocks of the Common Cherry. Soon after Christmas the tree was placed in a pine-stove, where it presently blossomed abundantly, and its fruit set perfectly well, as it had previously done in the Garden of the Society, and it ripened in March. The Cherries were middle sized, or rather small compared with the larger varieties of the Common Cherry; they were of a reddish amber colour, very sweet and juicy, and excellent for the season in which they ripened. The roots of the tree were confined to rather a small pot, and the plant was not even in a moderately vigorous state of growth; I therefore infer that the fruit did not acquire either the size, or state of perfection, which it would have attained, if the tree had been larger, and in a vigorous state of growth, and the season of the year favourable.

I inserted the two buds, which I had obtained, into stocks of the Common Cherry; and they seemed to take well, but both appeared lifeless in the spring, though one vegetated

late in the summer, and is now bearing a few Cherries in the pine-stove.

During the last spring, and early part of the summer, the old tree retained in the stove put out very numerous roots from the bases of its young branches, similar to those emitted, under similar circumstances, by the vine; and I thence inferred that the species might be readily propagated by cuttings; and having planted some cuttings in the pine-stove this year, in January, I have proved that plants may be thus raised with perfect facility.

I endeavoured to obtain seedling plants in the present spring; but a single seed only has vegetated. The remainder decayed without vegetating, but owing to what cause I am at present ignorant. I do not however doubt of better future success, or that numerous varieties of this species of Cherry will be readily obtained from seedling plants.

I intended to have obtained a very early crop of Cherries from the old tree in the present year, and for that purpose I had placed it in the open air, to winter, in the autumn; proposing to introduce it into the stove in November. But unfortunately going from home for a few days just before the time when I proposed to introduce it into the Pine-stove, two very severe frosty nights occurred, which so much injured the blossom buds, which were very far advanced, that they all fell off abortively, as those of a Peach Tree would certainly have done under similar circumstances. The tree, however, did not sustain further injury, and I believe that the species will be found quite hardy enough to succeed in the open air, if trained to a wall. It is much disposed to vegetate very early in the spring, and thence its blossoms, like

those of the Apricot Tree, will probably require some protection. This highly excitable habit seems to indicate a plant of a cold climate, probably that of Tartary; and I am inclined to think that it will ripen its fruit very early in the open air in this country.

In the last summer, and in the present year, I have supplied the old plant rather freely, with manure in a liquid state; and it is now growing with very great vigour, and will afford me a large number of buds and cuttings. Being wholly ignorant of the habits of the species, and fearful of destroying the only tree I possessed, I proceeded with much more caution than usual in the use of liquid manure; for I generally use it very freely, and without apprehension of ill effects, experience having satisfied me that plants of all kinds, even Heaths,* very often perish through want of food, and that they very rarely suffer from excess of it, when their roots are confined to the narrow limits of a pot.

* A plant of Heath (Erica australis, I believe) was placed under my care in the spring of 1823, with a request that I would treat it in any way I wished. It was then about eight inches high, and growing in a small quantity of peat earth and sand; and in that it continued to grow with very little increase of size till the following spring. From that period it was regularly supplied with water, which, though clear, was considerably tinged with an infusion of pigeons'-dung. I was apprehensive this kind of food would prove fatal to it; but far from this being the result, the plant grew with excessive health and vigour, emitting very numerous branches, eight of which exceeded eighteen inches each in length. It was then taken away by the owner of it, and I have not since seen or heard of it, but it left me in a state of luxuriant health. How far other species of this genus will bear being thus abundantly fed with liquid manure, is an interesting question to the gardener.

XIX. *On the Culture of the Pine Apple.** *In a Letter to* William Garfit Ashton, *Esq. Secretary to the Cambridgeshire Horticultural Society. By Mr.* James Dall, *Gardener to the* Earl of Hardwicke, *F.H.S. at Wimpole. Communicated by the Cambridgeshire Horticultural Society.*

Read February 20, 1827.

Sir,

In presenting you with an account of the treatment of the Pine Apple, for which the Cambridgeshire Horticultural Society's Medal was awarded to me, I must be understood as giving my method of cultivating Pines generally.

The Black Jamaica Pine Plant, under consideration, was one of a number of suckers taken from their parent plants in the month of June, 1823, and planted into pots of five inches and a half diameter and five inches deep, filled with a compost of brown loam, leaf mould and sheeps' dung reduced to earth in the proportion of two parts and a half of loam to one of each of the other two materials. This compost is what I use for the growth of Pine plants of all ages.

As soon as the suckers were potted, the pots were plunged into a bed of tanner's bark, the heat of which at the bottom of the pots was at all times kept between 88° and 100° of Fahrenheit's thermometer. Water was given sparingly

* This and the following Paper are the communications for which, as well as for his exhibitions, one of the annual Silver Medals presented to the Provincial Horticultural Societies, was awarded by the Cambridgeshire Horticultural Society to Mr. James Dall, for the year 1826.

for the space of three weeks, after that time it was applied more freely, but, at all periods and seasons, in giving water, I am guided by the state of the weather, and the heat of the bark-bed. The atmospherical heat in the pits during the nights was kept between 60° and 70°, and in the days the sun's heat was not permitted to raise the quicksilver in the thermometer more than 12 or 15 degrees above the heat obtained from the fermentation of the linings of the pits, which linings consisted of deciduous tree leaves only.

In the beginning of October the plants were shifted into pots a size larger, and the bark-bed prepared by sifting all the old tan, and replacing the dust thrown away by an equal quantity of fresh tan. Every time new tan is added to the old, the whole is forked over, that the old and new may be thoroughly mixed together. The plants in their fresh pots were regularly replunged, giving water and air as the weather and the state of the bark-bed rendered proper.

The following March, 1824, the plants were all removed from the pit, and turned out of their pots, and the earth shaken from their roots; their roots were trimmed of all dead fibres, and replanted in the same or similar sized pots, and in the same sort of compost as before stated. The bark-bed being renewed by sifting the upper half of the old tan, and adding fresh to make good that which had become rotten, the plants were then replunged in the bark-bed, and attended to as before with water and air, the heat being still the same as already recommended.

In the beginning of July the plants were all moved out of the pit, and shifted into pots a size larger. At this time there was no fresh tan added, the old being merely forked

over; the plants were then replunged in the bark-bed, and attended to as before with water, air, &c.

It is necessary to state, that should the weather prove clear with much sun, the Pine plants of all ages should be shaded a few hours in the middle of the day, for at least a fortnight after each shifting.

In the beginning of October the plants were again moved out of the bark-bed, and shifted into the pots destined for them to fruit in. The size of the pots at this shifting was about twelve inches diameter and two feet and a half deep. The bark-bed was prepared the same as in October, 1823. The plants were again replunged in the bark-bed, and treated as before.

In the beginning of March, 1825, the plants were moved out of the bark-bed; and all those that had started into fruit, together with all the others that appeared in a forward state for fruiting, were top dressed, by twisting off a few of the undermost leaves, and carefully removing the loose earth from the tops of the pots, and filling them up with fresh compost. The bark-bed at this time was prepared the same as at the October shiftings. The pots were then plunged a little more than half their depth into the bark-bed; and in this state they remained till the end of May. At that time fresh dry tan was filled in between the pots as high as their tops, which increased the heat of the bark-bed to a sufficient degree for ripening all the fruit.

For the more safe and expeditious manner of filling tan round the pots that are partly plunged in the bark-bed, as here stated, a pipe or funnel made of sheet iron is used; the mouth that receives the tan is fifteen inches, and the

lower end four and a half inches diameter, with two handles fixed to it, so that the operator easily holds it while a lad is filling in the bark from a flower pot.

After the fruit has done blooming, besides giving the necessary watering at the root of the plants, I occasionally, in fine warm weather, sprinkle the fruits and leaves of the plants all over with clean soft water, warmed to about 80 or 85 degrees; this is the temperature I give to all the water I use for my Pine plants. This top watering I give about four o'clock in the afternoon, and at the same time shut the glass sashes of the pit all close.

I remain, Sir,

Your obedient Servant,

JAMES DALL.

Wimpole Garden,
March 29, 1826.

XX. *On forcing Asparagus. In a Letter to* William Garfit Ashton, *Esq. Secretary to the Cambridgeshire Horticultural Society. By Mr.* James Dall, *Gardener to the* Earl of Hardwicke, *F.H.S. at Wimpole. Communicated by the Cambridgeshire Horticultural Society.*

Read February 20, 1827.

Sir,

In compliance with the desire of the Cambridgeshire Horticultural Society, I transmit a statement of my method of forcing Asparagus. About the second week in November I make a hot-bed of leaves (which have been used the preceding winter and summer as linings to the Pine pits) three feet high, and as long and broad as will hold a three-light cucumber frame. I then dig up the roots, which are never less than five years old from seed when used for forcing. I lift them with as much earth as will hang to them, and place them as close together in the frame as possible, throwing sifted vegetable mould between them as they are laid in. When the planting is finished, I give a little water to settle the earth close to the roots. After this I cover the crowns three inches deep with vegetable mould and sifted rotten tan mixed together, and then place the glass on the frame. I give as much air in the day as the state of the weather will permit, and when the shoots from the roots begin to rise through the three inches of tan and earth, I add three inches more of the same compost, and as they become fit for use, I gather them by pushing my hand down the head, and with

the fore finger twisting them off close, at where they spring from the root.

A few days after the frame is filled with Asparagus roots, I line the bed all round with the same sort of leaves as the bed is made of. If sharp frosts set in I add fresh leaves to the lining, as I see need for it. When the roots have produced all they can, I clear away the exhausted crowns and earth, fork up the leaves of the bed without moving the frame, and plant fresh roots as before.

I remain, Sir,

Your most obedient Servant,

JAMES DALL.

Wimpole Garden,
March 29, 1826.

XXI. *Observations on forcing Garden Rhubarb. By Mr.* WILLIAM STOTHARD, *Under Gardener in the Experimental Fruit and Kitchen Garden Department of the Garden of the Horticultural Society at Chiswick.*

Read March 6, 1827.

THE cultivation of Rhubarb for culinary purposes has of late years been much practiced in private gardens. The forced footstalks of the leaves are also in much request during winter and spring, in the market of the metropolis. The easiest and most efficacious method of producing these, being therefore an object of importance, experiments have been tried in the Department under my charge in order to ascertain this point, and I have now to report that which appears to have been the most successful.

The subject of forcing and blanching Rhubarb has, at different times, occupied the attention of the Society, and Papers on it have been published in the Transactions. At an early period* Mr. HARE pointed out the superiority of the blanched leaves; and stated the accidental discovery in the Chelsea Botanic Garden of that effect having been produced in spring, by simply raising earth over the crown of the roots. In 1818,† an account, by Mr. JUDD, of a method of forcing Rhubarb growing in open borders, by means of dung heaped over a wooden frame, was printed. Subsequently, in the same year, appeared‡

* Horticultural Transactions, Vol. ii. page 258.

† Horticultural Transactions, Vol. iii. page 143.

‡ Horticultural Transactions, Vol. iii. page 154.

a Communication from the President, on a plan of forcing Rhubarb in pots, the principle of which must be the guide in every mode of growing these plants in houses, however the details may differ. Mr. KNIGHT used one year-old roots, (raised from cuttings of old roots) planted close together in pots; which were covered by inverted pots, and placed in the dark part of a vinery, where nothing else would thrive. He suggested, that seedlings, raised from autumnal sown seeds, would also be sufficiently strong for the purpose, and, as was obvious, observed that other places, where a certain temperature was maintained, would answer equally with a vinery. Mr. JAMES SMITH, of Hopetoun House, reported* in March, 1822, to the Society, his success with old roots of Rheum hybridum planted in boxes, and placed in a mushroom house. The particulars of Mr. SMITH's practice have been lately (1825) published in the Memoirs of the Caledonian Horticultural Society, Vol. iii. p. 451.

The sample of forced Rhubarb sent from the Garden of the Society, and exhibited at the Meeting on the 20th of February, was produced from seedling plants of the previous spring. The seed was sown on the 3rd of April last, in small beds, on a wall border facing the east, and lightly covered with mould. On account of the dry weather at that season, the beds were watered once or twice to make the seeds vegetate. Very little attention was necessary for the plants during the rest of the season, except in thinning and weeding them. At the end of October they were taken up, by opening a trench at one end of the border, and the roots were thus lifted without injuring their fibres. After the whole were up, the largest

* See Horticultural Transactions, Vol. vi. page 111.

roots were selected for potting. These were planted in common garden mould, in pots between twelve and fourteen inches deep, and of ten inches diameter at top; five or six plants being put into each pot, according to the size of their roots. After the whole were potted, they were placed behind a wall on a north border, having been well watered to settle the mould in the pots. They remained there without further attention until they were wanted for forcing. They were at various successive times placed on the shelves, and on the floor of the Russian or Winter Forcing-house, which is used for growing mushrooms, blanching salads, and other similar purposes, the light being entirely excluded. They were occasionally supplied with water. The temperature of the house was generally maintained, by means of a fire flue and the dung used in the house, at from 55 to 60 degrees of Fahrenheit. The produce was from five to six leaves from each root; and in five weeks from the time the pots were put into the house, the foot-stalks of the leaves became from ten to fourteen inches long, and were fit for use. The first were ready to gather early in January.

For a comparison, an equal quantity of old roots was placed in the house at the same time as some of the seedlings. The young roots proved far superior. When the leaves on them were ready to cut, those of the old plants were just appearing above ground; which is to be accounted for from their roots, owing to their large size, requiring to be cut to get them into the pots, and consequently becoming injured. A great advantage derived from the use of seedling plants is, that a quantity of them may be grown in a small space with little trouble and cost. After being forced, the

roots may be thrown away and fresh ones raised every year, the same as is done with Succories.

Mr. WILLIAM BUCK's method of growing forced Rhubarb, described in a preceding part of this Volume, page 89, differs in several points from that described here. He places his plants in decayed tan, in preference to common mould; the temperature of his house is kept considerably lower, being from 45 to 55 degrees; and he uses plants raised from cuttings of the old roots, instead of seedlings. This is undoubtedly necessary, where any particular variety of a species, which cannot be raised from seeds with certainty, is used.

I have observed, that some Market Gardeners force Rhubarb in large quantities for sale, planting it in the earth on the floors of vineries. When old plants are treated in this manner, if they are taken up entire, and with good roots, the produce will be much greater than from those grown in pots; but such means are not at the command of every one, who may wish to cultivate this useful esculent.

With good management, sixty pots forced in regular succession, will be quite sufficient to supply a moderately sized family. The seed should be saved from the best sorts, such as BUCK's Rhubarb, and the earliest varieties of Rheum Undulatum. The leaves of the kinds of Rhubarb which have scarlet foot-stalks, do not lose that quality by being grown in a dark place. Their colour is then rather more delicate; but it is preserved in the dressing equally as well as when leaves which are grown in the open ground are used.

XXII. *Account of some remarkable Holly Hedges and Trees in Scotland. By* Joseph Sabine, *Esq. F.R.S. &c. Secretary.*

Read February 20, 1827.

The utility of Evergreen fences to gardens, and especially those of Holly, seems to have been more considered by Horticulturists in England in former than in latter times; for they are seldom to be seen except in old gardens, which remain unaltered from their former state. The particular advantages of such protections have been pointed out by Mr. Williams, in a Communication to the Horticultural Society, which is published in the second Volume of the Transactions, page 324. The satisfactory explanation given in that Paper, of the causes why evergreen are preferable to deciduous hedges, has induced in some places a revival of the practice of planting them.

Our northern neighbours in this kingdom, in former periods, appear to have been more especially aware of the benefits arising from Holly screens to their gardens, and their successors have shewn their judgment in the preservation of them at the present day. Old hedges of this character are now of much more frequent occurrence in Scotland than in England. The rigour of their seasons obliges Scotch gardeners to be more attentive to whatever will afford the best and warmest shelter.

In a journey through parts of Scotland, which I made in in the autumn of the year 1825, I was much struck with the

beauty and size of the Holly hedges and trees, at several places which I visited. Some were so deserving of notice, that I have been induced to collect the particulars respecting them, not only as an object of present interest, but as information for the use of succeeding enquirers.

The most remarkable, especially on account of their extent, are the Holly hedges at Tynningham, in East Lothian, the residence of the Earl of Haddington. They are on the western side of the Mansion-house, and altogether are of the extent of 2952 yards. The most striking are two hedges, on the sides of a grass walk thirty-six feet wide, extending in a strait line eastward, from the road leading to North Berwick, towards the Mansion-house. The walk is 743 yards long. These hedges are eleven feet broad at the base, and fifteen feet high. The hedge, east of the Melon ground, is 110 yards long, twelve feet broad, and eighteen feet high. A detached hedge in the grounds contiguous to the approach to the house is 170 yards long, thirteen feet broad, and twenty-five feet high. The hedge east of the garden is 249 yards long, nine feet broad, and ten feet high, except a small portion of it, south of the passage through it into the garden, that is twelve feet broad, and twenty-one feet high. The remaining hedges to complete the total length first named, are those on each side the North Berwick road; that portion on the eastern side of the road, which is north of the grass walk above mentioned, is 308 yards long, and corresponds in height and breadth with the hedges adjoining to the walk. The rest of this hedge south of the walk is 409 yards long, nine feet and a half broad, and eight feet high. The hedge on the opposite or western side of the road is 220 yards long, eleven feet broad, and twelve feet high.

The hedges bounding the grass walk, that to the east of the garden, and those on the sides of the North Berwick road, were planted in 1712, by THOMAS, sixth Earl of HADDINGTON. The detached hedge in the grounds is perhaps of the same age, but its date is not certainly known. The hedge east of the Melon ground, which is in the form of a crescent, and is nearest to the house, is evidently of a later date than the rest. All the other mentioned hedges are in strait lines. There are several more hedges of Holly in different parts of the Tynningham estate, of considerable extent and size, probably planted at the same period with the first of the above.

The Nobleman to whom these hedges owe their origin was particularly fond of planting. He wrote a Treatise* on the subject, and has left to his successors a noble monument of his attachment to it in Binning Wood, which is about a mile and a half from Tynningham, and contains three hundred English† acres entirely planted by him.

The Holly hedges above described, (with the exception

* This work, which is scarce, is dated Tynningham, 22 December, 1733. It was printed in 12mo. at Edinburgh, in 1761, and is intitled, "A Treatise on the Manner of Raising Forest Trees, &c. In a Letter from the Right Honourable The Earl of (HADDINGTON,) to his Grandson." Besides notices of the improvements made by the Author on his estate in East Lothian, the book contains very excellent practical instructions on raising and planting different forest trees, many of which are worthy of attention in the present day. He mentions, that when he came to reside on his property at Tynningham, in 1700, there was not above 14 acres planted with trees. The planting Binning Wood, on the ground then called the Muir of Tynningham, was done in 1707, at the instance of his Lady.

† In the Treatise of Lord HADDINGTON, above referred to, it is stated that Binning Wood contained 300 Scotch acres, equal to about 374 English acres. Lord HADDINGTON must consequently have included in his account another wood which adjoins to Binning Wood, and which was planted about the same time.

of that adjoining the Melon ground, which is only annually simply pruned), are regularly clipped in each year, in April; the work occupying the time of five labourers about three weeks. The hedges are kept with an even exterior, and contracted towards the top. They are carefully protected from the bite of cattle, and especially from sheep, which are very fond of the bark, shoots, and young leaves of the Holly. They are planted on raised banks, which in most cases are kept dry by ditches on one or both sides. The soil in which the most vigorous growth is apparent, is a deep light loam. The plants do not grow so luxuriantly when it is either sand or clay, and less well when it is moist with a retentive subsoil. The object of the banks and ditches here noticed, was to keep the roots dry and well drained.

There are several single Hollies of fine dimensions, growing mixed with other trees of considerable magnitude, near the Mansion-house at Tynningham; the largest of these measures five feet three inches in circumference at three feet from the ground; the stem is clear of branches to fourteen feet high, and the total height of the tree is fifty-four feet. In Binning Wood are also some very fine specimens of Hollies; the most singular of these has a girth at three feet from the ground, of seven feet three inches, after which it divides into two large branches, and attains the height of forty-six feet.

The Holly hedges at Colinton House, the seat of Sir William Forbes, about three miles south-west of Edinburgh, though not of equal extent to those of Tynningham, exceed them in size as well as age. They form part of the outer boundaries of two nearly contiguous, almost square

shrubbery gardens, which are situated between the pleasure grounds surrounding the Mansion-house and the kitchen garden. One of these gardens is divided by a sunk fence on its north side from the pleasure grounds; the other is separated from the kitchen garden by a wall; the remaining three sides of each are bounded by Holly hedges. The hedges, which are to the north of one garden and to the south of the other, are separated from each other by a broad grass walk ten feet wide. They are supposed to have been planted some time between the years 1670 and 1680, or thereabouts, but certainly not later than the latter year. The soil on which they grow is light and dry, with a gravelly substratum. They are in very vigorous health. Formerly they were kept much lower than at present. When Colinton House, twenty seven years ago, became the property of Sir WILLIAM FORBES, they had been neglected, and suffered to become irregular and unsightly. Proper attention having been subsequently paid to them, they are now in good order, and are kept so by clipping and judicious pruning once in every two or three years. The extent of the hedges altogether is 1120 feet; those on the sides of the grass walk being 200 feet each; the eastern and western hedges of the garden nearest to the house are each 170 feet; the eastern and western hedges of the farthest garden are each 190 feet. Their breadth at the bottom is fifteen feet, which diminishes to two feet at the top. The height varies from twenty-five to twenty-eight feet, but appears from below to be very even, notwithstanding the difference. They form a beautiful and secure protection to the gardens, of which that next the pleasure grounds is planted with American and Evergreen shrubs, and the other with Deciduous shrubs.

Another Holly hedge, of later date than the preceding, is also deserving of notice. It is the boundary between the flower and kitchen gardens at Moredun, the seat of David Anderson, Esq., about three miles south of Edinburgh, near to the village of Gilmerton, and in the parish of Liberton. It was planted in the beginning of the last century by Sir James Stewart, Bart., of Good-Trees, the name by which Moredun was then known. It extends in a straight line running east and west 378 feet; it is twenty feet high, nine feet wide at bottom, and four feet wide at top. Some few years since it was in a very ragged state, occasioned partly by an opening which had been made for a passage through it, and partly by injury from a fire which occurred in a building near to it. By good management and judicious pruning it has been brought into its present regular state, having been reduced in some parts to make it even. It is now growing vigorously, and will soon equal the height of any of the hedges before mentioned, it being proposed to allow it to taper to a point at the top. It is annually pruned and brought into shape with hedge shears.

Among the magnificent trees and evergreens which adorn the grounds on the banks of the Frith of Forth, at Hopetoun House, the seat of The Earl of Hopetoun, near Queensferry, the Hollies are not the least conspicuous. These were planted about, but previous to, the year 1740. Most of them have very fine trunks, the largest being fifty feet high, with a clear trunk of twenty feet, and measuring, at three feet from the ground, five feet eight inches in circumference. Several are of equal height, with trunks from ten to twenty feet long, and measuring, at the above mentioned distance

from the ground, from four and a half to five feet round. Many of the Hollies are variegated, but these are of rather smaller dimensions. Both the plain and variegated trees were originally planted as hedges, and were kept clipped in the Dutch fashion until 1778, when the hedges were destroyed, but the finest specimens of the trees being then preserved, they have grown to the sizes here stated.

From the circumstance of the rapid growth and fine appearance of the different hedges and trees I have above described, it may be supposed that the climate of Scotland is peculiarly propitious to the growth of the Holly. All those however which have been noticed, have been planted by the hand of man; but in the remaining instance of fine Hollies which I have to notice, I am inclined to consider them as in a perfectly native state, and indigenous to the spot.

The trees I allude to are growing on an extensive bank, to the east of, and contiguous to, Gordon Castle, the seat of the Duke of Gordon, near Fochabers, in Bamffshire. The bank is nearly one-third of a mile long, running from north to south, and facing the west in an irregular curve, broken by projections and hollows, down which rills of water flow into a small burn at its base. The slope of the bank varies from thirty to one hundred and twenty-five feet; the ground below it is quite flat, that above the slope rises gradually towards the east. The flat part is kept as pleasure ground, and is traversed by a gravel walk running along the foot of the slope and passing close by its projecting angles. The burn runs parallel to and on the west of the walk, being separated from it by a narrow strip of grass. A flat of short

grass, of unequal breadth, extends westward from the burn to a carriage road, from which the pleasure ground is separated by a wooden fence. Above, the bank is divided from the adjoining enclosure by a hedge on the top of a sunk fence, parallel to the bank, at about sixty feet from its crown. The greatest number of Hollies grow upon the bank, but several are in the flat ground below. These last are mixed with Birches, Geans, Ashes, and especially with Alders, some of which last within the pleasure grounds, are of extraordinary size and height.* The same kinds of trees are also occasionally mixed with the Hollies on the bank. Few of the Hollies stand single; several appear to spring from the same root, as if they had shot up from the stump after the original tree had been cut down, and many grow very close together, forming jointly a grand mass. The stumps of the former trees are in some instances perceptible, and in others, the earth on the sloping parts of the bank having fallen away from the roots, show the origin of the present growth to have been the original stock. One group, where the bank is rather flat, consists of fifty-five trees, growing in a spot not quite one hundred and thirty-four feet in circumference, and the girth of these, at six feet from the ground, is from three feet six inches to eighteen inches. There are altogether seventy-three groups of Holly-trees, the trees forming which are in number 508, and of these 87 have trunks free from branches from eight to fourteen feet

* These Alders are the finest of the kind I have ever seen. They have, when viewed at a distance, very much the appearance of Oaks. The dimensions of three of them, are as follows:—one, 71 feet high, and 9 feet 4 inches in girth; one, 61½ feet high, and 7 feet 4 inches in girth; one, 58 feet high, and 8 feet in girth; the girths being taken at from 5 to 6 feet from the ground.

high, and are from three to four and a half feet in girth at six feet from the ground; four are larger, two girthing five feet ten inches, one four feet ten inches, and one four feet three inches at the above height. At the southern extremity of the bank, where the slope is small, it is covered by smaller Hollies, growing so thickly together that a man cannot pass through them; they appear to have arisen from seed, and are of younger growth than the others; they exceed one hundred in number, but none are more than two feet in girth. On the flat ground, adjoining the bottom of the southern part of the bank, some Hollies of large dimensions grow, the measurements of the two best of which are as follows:

	Total Height. Feet. In.		Feet. In.		Feet. In.		Feet. In.
1.	52 0;	girth at the root,	7 5;	at six feet,	5 7;	height to branches,	10 6
2.	43 9;	ditto - - -	5 6;	ditto -	4 9;	ditto - - -	8 6.

The first of these trees divides after the above height into three large branches, the second into two branches. A few of the Hollies on the bank are nearly as tall as the above.

There is no record existing relating to these singular trees, nor any account of their age; none have been felled, excepting those which have exhibited symptoms of decay, within the knowledge of any person now alive.

XXIII. *An Account of a Plan of Heating Stoves by means of Hot Water, employed in the Garden of* Anthony Bacon, *Esq. F. H. S. In a Letter to the Secretary. By Mr.* William Whale, *Gardener to Mr.* Bacon.

Read December 19, 1826.

Sir,

Having been informed by my employer, Anthony Bacon, Esq., that you wished for a description of the mode of heating Forcing-houses with hot water, as practiced in his gardens, of which I have the management at this place, I beg leave to inform you, that, from the experience I have had for the last twenty years in forcing, both with brick-flues and steam, I certainly give the preference to the method Mr. Bacon has adopted of heating his houses with hot water.

Brick-flues are subject from their numerous joints, and the mortar cracking, to give out at times a sulphureous gas which is injurious to plants; and even with two fire-places in a house forty or fifty feet long, it is impossible to keep up an equal temperature in the whole length. The houses get over heated in the neighbourhood of the fire-place, and it is difficult to maintain a proper warmth at the extremities of the flues.

Steam may do very well on a large scale, and when there is constant attention to the fire both day and night; but the

objections are :—the great expence of a steam boiler, and the apparatus belonging to it ; the frequent repairs that are required, and the necessary attention to the fire, which is as great upon a small scale as on a large one. Besides this, there is a greater risk of explosion in a hot-house steam boiler than in that of a steam engine ; for steam engines have generally persons properly instructed to manage them, but gardeners, or their assistants, cannot be so competent.

The heating with hot water, has none of the objections I have mentioned as belonging to flues and steam. The apparatus is simple, and not liable to get out of order. The boiler has only a loose wooden cover, and no safety valves are required. The fuel consumed is very moderate ; and when once the water is heated very little attention is wanted, for it retains its heat for many hours after the fire has gone out.

The plan of heating with hot water was used by Mr. Bacon, and put in practice on a small scale, with success, at his seat at Aberamen, in Glamorganshire, in the year 1822 ; and I understand that Mr. Atkinson, who furnished the plans and working drawings for the erection of the houses here, constructed in the same year a model of a similar apparatus, without at the time having had any communication with Mr. Bacon, with which he tried the experiment successfully.

This garden contains four houses for Vines and Peaches that are heated with hot water, and also a Pine-pit heated in the same manner, except a trifling variation noticed hereafter. I shall describe one of the houses, a Vinery, as shewn in the annexed engraving.

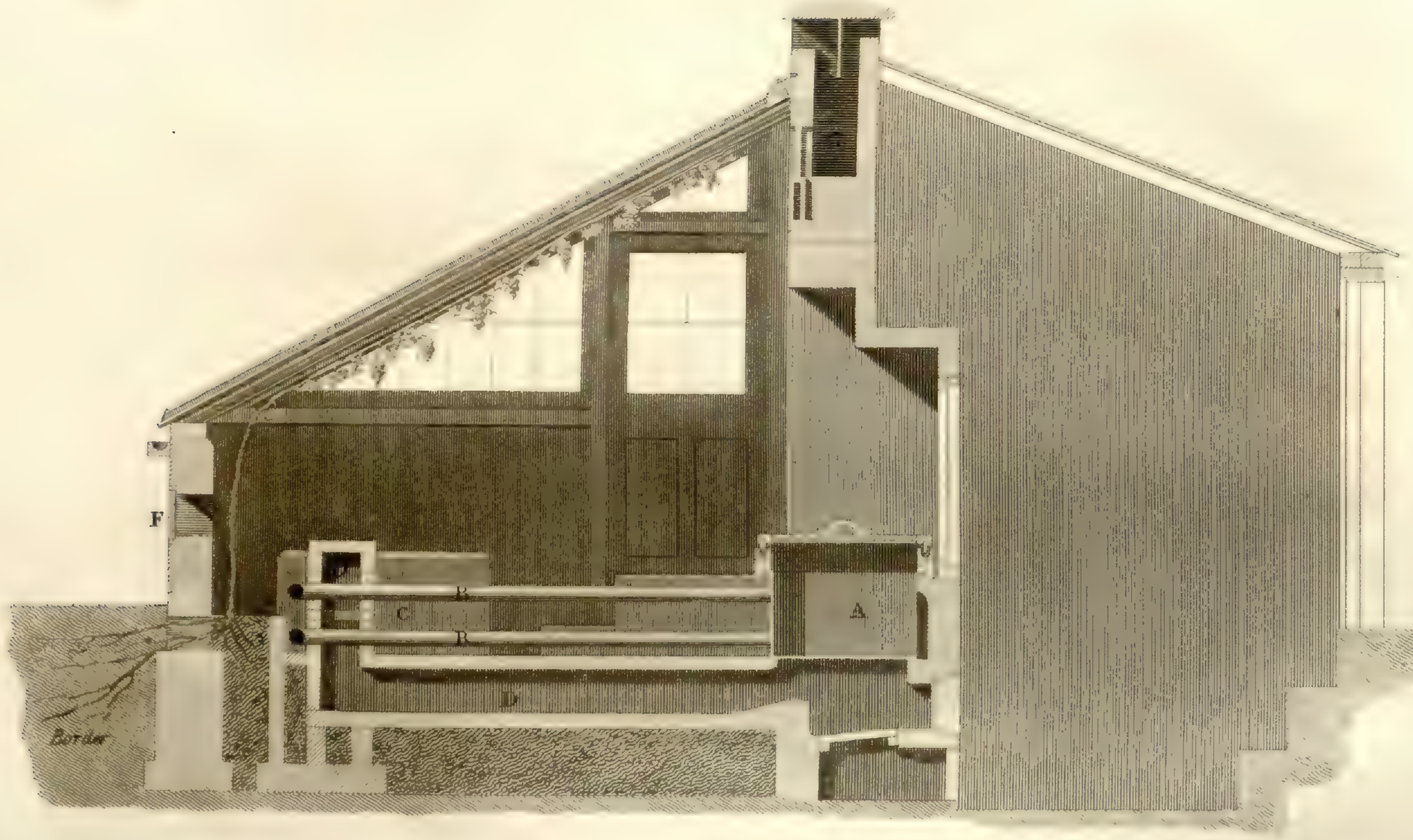
The house is forty feet long, and ten feet wide inside, heated by a boiler placed in a recess in the centre of the back wall; the fire-place under the boiler is got at from a back shed. The boiler is two feet six inches long, one foot six inches wide, and one foot eight inches deep. From the end of the boiler proceed horizontally four cast-iron pipes of three and a half inches diameter. Two of them are joined to the boiler just above the bottom, and the other two directly above, and just below the surface of the water. The house is divided by glazed partitions into three compartments, for the convenience of forcing one part without the other. The middle compartment is two lights in width, and the other two have four lights each. The pipes from the boiler go horizontally to the front of the house; when one upper and one lower pipe branch to the east compartment, and other two pipes to the west, and are carried to the ends of the house along the sides of the flues, where they unite to cast-iron reservoirs at each end of the house, which reservoirs are each three feet six inches long, one foot six inches wide, and one foot eight inches deep, having iron covers. These reservoirs are filled with water that communicates by means of the pipes with the water in the boiler.

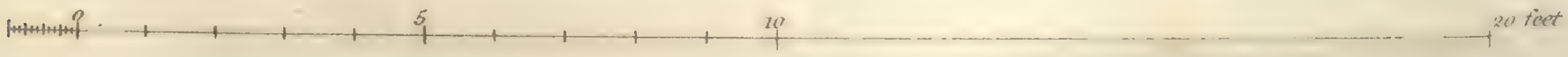
When the boiler, pipes, and reservoirs are filled, and a fire lighted under the boiler, the heated water ascending to the top of the boiler, forces its way along the upper pipes to the reservoirs, the cooled water finding its way back to the bottom of the boiler through the under pipes; and the circulation continues regular as long as there is any heat under the boiler, the hot-water flowing through the upper pipes to

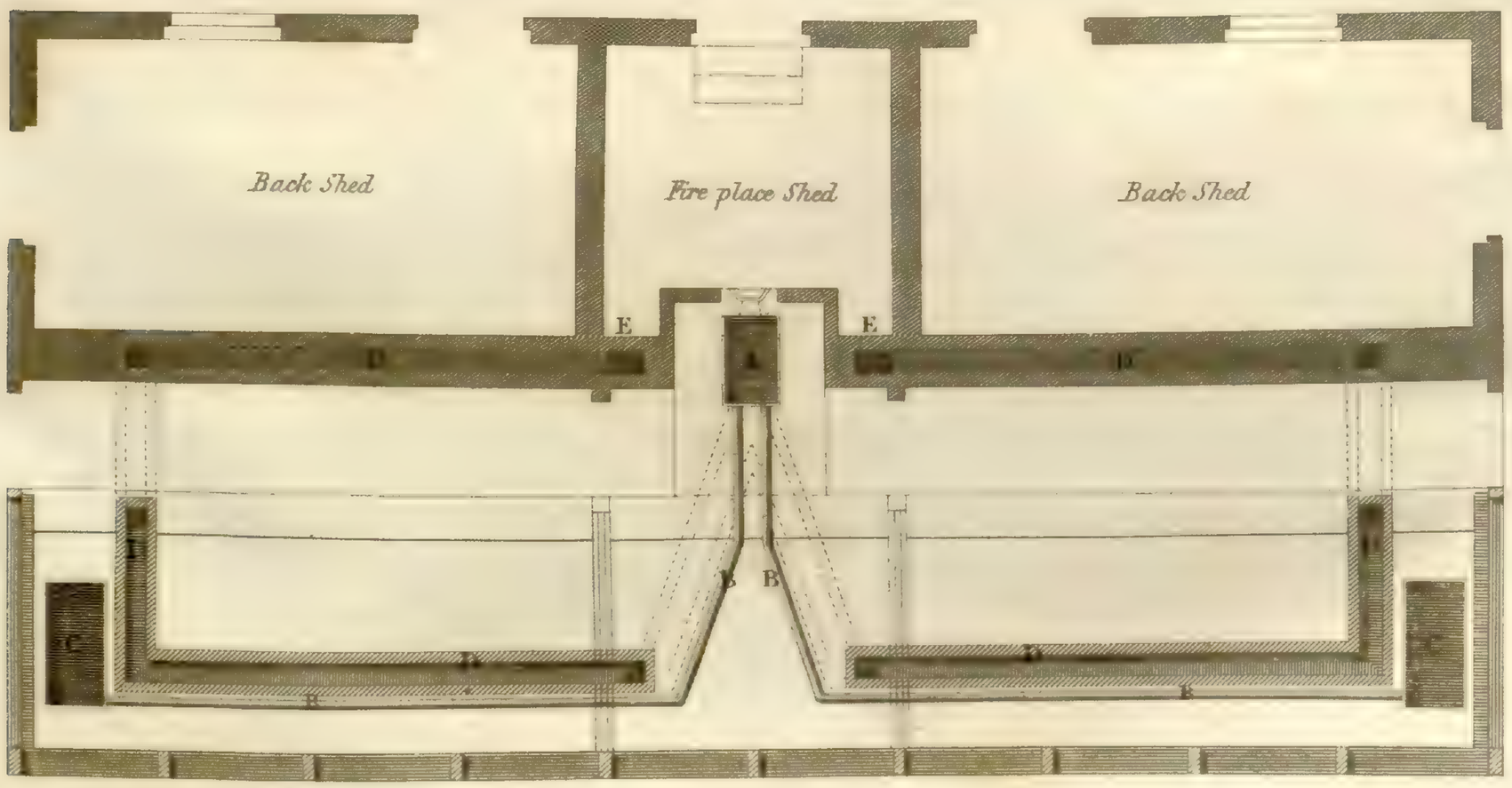
the reservoir, and as it cools, returning back to the boiler through the under pipes. I have repeatedly, after the water has been heated, immersed a thermometer in the reservoirs at the ends of the house, and have only found a difference of three or four degrees between that and the water in the boiler. It is not necessary to make the water boil; and if the fire is judiciously managed no steam will be raised, and no water wasted. It is however necessary to examine the boiler occasionally, and to add water when any has evaporated.

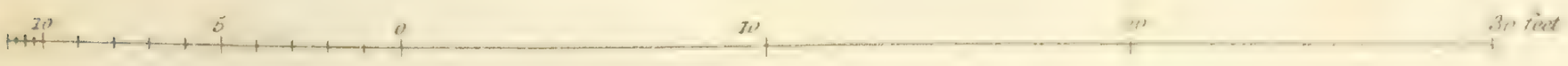
In Mr. Bacon's two pine pits, a fire-place with a boiler over it is placed between them. They are each thirty feet long and ten feet wide. The western pit is heated by hot-water pipes, the eastern one by a common flue, heated by the same fire after it has passed under the boiler. During the severe nights of last winter thermometers were suspended in these pits, and examined every morning when the pits were uncovered; that heated by hot-water was invariably from seven to nine degrees higher than that in the flued pit. It appears that the heat lost from the fire after it has passed under the boiler, is only trifling; and if the pits were to be constructed again, I would put water-pipes in both of them, omitting the flue, and allowing the smoke to pass immediately to a chimney after leaving the boiler, and I have no doubt but the same boiler would be sufficient for both pits.

Valves might be fixed in the boiler, pipes, and reservoirs, for letting steam into the house, if required; but that would induce the necessity of boiling the water; and it has not been done here, as I find I can produce all the steam I









Drawn by John Douglas

Section and Plan of Vinery at Elcot.

J.W. Lowry Sculp.

require, with little trouble, by watering the pipes with a watering pot.

The annexed plans, will explain more fully the arrangement of the apparatus; and I am persuaded that the advantages of this mode of heating, with its great simplicity, will give satisfaction to every practical gardener who has an opportunity of trying it. When once the water is heated, and the fires well made, he may retire to rest, certain that the pipes will not get cold during the night, but retain a considerable heat in the morning.

I have the honour to be, Sir,

Your most obedient humble servant,

WILLIAM WHALE.

Elcot, near Newbury,
December 1, 1826.

Reference to the Plate.

A, Boiler.

B, B, Cast-iron pipes that convey the water to the iron reservoirs at the ends of the house.

C, C, Cast-iron reservoirs.

D, D, Smoke flues, which are conducted by the sides of the water-pipes, return at each end of the house, go under the paths, and are brought in the back wall to Chimneys at E, E, in the fire-place shed.

There are dampers in each chimney when they are both open; the smoke from the fire-place passes through the flues of both east and west compartments of the house, but the heat may be confined to one compartment by closing the flue of the other with the damper.

By plugs of wood being put into the upper and lower pipes on either side within the boiler, the heated water may be confined to one compartment, without warming the other. This is a convenience, when one part may require to be forced before the other.

The lights of the house are fixed, and ventilation carried on by wooden doors that open in the front wall at F, and at the top of the back wall at G. Both Vines and Peaches are planted inside of the houses, and the roots run through arches in the front wall to the border outside the house.

List of LARGE SILVER MEDALS *presented by* ORDER *of the* COUNCIL *of the* HORTICULTURAL SOCIETY *of* LONDON, *from May* 1, 1826, *to May* 1, 1827.

To Captain HENRY HANWELL, of the Hudson's Bay Company's Ship, the William and Ann, for his attentions to Mr. DAVID DOUGLAS, the Society's Collector, in his Voyage to the mouth of the River Columbia, and for the care and attention given by him to the collection of Seeds and Specimens sent home by Mr. DOUGLAS.

To JOHN M^{c} LOUGHLAN, Esq., the Chief Factor of the Hudson's Bay Company, at the mouth of the River Columbia, for the assistance rendered to Mr. DAVID DOUGLAS, whilst making his Collections in the countries belonging to the Hudson's Bay Company, in the Western part of North America.

To Captain RICHARD RAWES, F. H. S. for his continued and successful exertions in the introduction of New Ornamental Plants from China.

To Captain ROBERT WELBANK, for the original introduction of the Glycine Sinensis, from China, the Plant having proved hardy, and being highly ornamental.

To HENRY WILLOCK, Esq. F. H. S. for having successfully transmitted from Persia, seeds of several varieties of Melons of great excellence.

To the Earl of POWIS, F. H. S. for his success in ripening fruits of the Mango, in his Garden at Walcot, in Shropshire.

To Mr. JOHN GEORGE FULLER, F. H. S. for his successful cultivation of various Fruits in his Garden at Streatham, in Surrey,

as evinced by the exhibitions from it, sent to the Meetings of the Society.

To JOHN MOTTEUX, Esq. F.H.S. for his great attention to the Cultivation of Fruits in his Garden at Beechamwell, in Norfolk, as proved by his frequent exhibitions of its produce to the Society.

List *of* Persons *to whom the* Banksian Medal *has been presented, by* Order *of the* Council *of the* Horticultural Society of London, *for* Exhibitions *at* General Meetings *of the* Society, *from May* 1, 1826, *to May* 1, 1827.

To the Earl of Powis, F. H. S. for Specimens of the Loquat, exhibited May 2, 1826.

To Mr. George Loddiges, F. H. S. for the Flower of Carolinea insignis, exhibited May 16, 1826.

To Mr. John Lee, F. H. S. for Flowers of Rhododendrons, exhibited June 6, 1826.

To Mrs. Beaumont, for Fruit of Xanthochymus pictorius, exhibited June 6, 1826.

To Edward Gray, Esq. F. H. S. for Flowers of Magnolia macrophylla, exhibited June 20, 1826.

To Mr. Robert Blockley, for Cucumbers, exhibited August 1, 1826.

To Mr. John Haythorn, for a Pine Apple and a Melon, exhibited August 1, 1826.

To Charles Holford, Esq. F. H. S. for Grapes, exhibited August 15, 1826.

To Mr. Stephen Hooker, F. H. S. for the Diamond Plum, exhibited September 5, 1826.

To Mr. John Miller, F. H. S. for Flowers of Double Dahlias, exhibited September 19, 1826.

To the Rev. Thomas Coney, F. H. S. for Grapes, exhibited September 19, 1826.

To Mr. James Veitch, for Double Dahlias, exhibited September 19, 1826.

To Mr. Peter Langelier, of Jersey, for Pears, exhibited October 3, 1826.

To Mons. Louis Claude Noisette, C. M. H. S. of Paris, for Pears, exhibited October 17, 1826.

To Sir George Stewart Mackenzie, Bart. F. H. S. for Apples, exhibited October 17, 1826.

To John Allnutt, Esq. F. H. S. for Flowers of Camellias, exhibited January 2, 1827.

To Jesse Buel, Esq. C. M. H. S. of New York, for American Apples, exhibited February 20, 1827.

To John Luscombe Luscombe, Esq. for Oranges, Citrons, and Lemons, grown in the open air, exhibited April 17, 1827.

List of the PERSONS *to whom the* CERTIFICATE, *in lieu of the* BANKSIAN MEDAL, *has been presented, by* ORDER *of the* COUNCIL *of the* HORTICULTURAL SOCIETY OF LONDON, *for* EXHIBITIONS *at* GENERAL MEETINGS *of the* SOCIETY, *from May* 1, 1826, *to May* 1, 1827.

N. B. Only one Banksian Medal can be awarded to the same person in the same year, but in those cases where an Exhibition, which would have deserved the Medal, is made by any Person who has received the Banksian Medal for a previous Exhibition within the year, an Engraved Certificate, instead of a Second Medal, is given to the Exhibitor.

To Mr. PETER LANGELIER, of Jersey, for Pears and Apples, exhibited November 7, 1826.

To Mr. JOHN HAYTHORN, for Apples, exhibited November 7, 1826.

Medals presented to Local Horticultural Societies *within the United Kingdom.*

The Council of the Horticultural Society of London have resolved to give in each year, commencing with 1826, one of the Large Silver Medals of the Society, to such of the Horticultural Societies established within the United Kingdom, as they are in communication with; to be awarded by the Council or Committee of each Society respectively, to any one person within their district, who, by his Exhibitions, Cultivation, or Communications on Horticultural subjects within the year, shall appear to the said Council or Committee to be most deserving of such testimony of merit, provided there shall be considered one sufficiently deserving.

The award of the Medals is to be made as soon as possible after the termination of the year, and a Report is to be transmitted from the Secretary of each Society, to the Secretary of the Horticultural Society of London, for the information of the Council, as to the Person and Subject to whom and for which the Medal may have been awarded.

The donation of these Medals will be announced at a General Meeting of the Horticultural Society of London, previous to its Anniversary in each year; after which the Medals will be transmitted, and a List of the Medals so given, will be Annually printed to accompany the published Transactions of the Horticultural Society of London.

The object of the Council, in making this regulation, is twofold. Firstly, to distinguish and bring into notice Horticultural merit and talent, which may be so situated as not to come within their knowledge by any other means. Secondly, to shew that their

views are general in the Patronage and Encouragement of Horticulture, and not confined to those matters only which come within their own immediate observation. The determination on the merit of the individual to be complimented, will be left entirely to the judgement of the Society awarding the Medal, and will not be interfered with in the least.

It is proposed that the aforesaid Medals shall not in any case be awarded by the same Society twice to any one Individual.

With regard to the Caledonian Horticultural Society, as the districts of the various Provincial Societies of Scotland are also included within the range of that Institution, it is recommended that, if in any year one of those Provincial Societies shall have selected, as worthy of the Medal, the same person to whom the award of the Caledonian Horticultural Society shall have at the same time been made, in such case, the Provincial Society shall be requested to proceed to a new nomination, without however precluding the person first named by it, from being entitled to receive a Medal from his own Provincial Society, in a subsequent year.

Under the above Regulations, the Large Silver Medals of the Society have been awarded for the year 1826, as follows:

By the CALEDONIAN HORTICULTURAL SOCIETY, to Mr. JOHN HENDERSON, of Den Nursery, at Brechin, in Forfarshire, for his Communication entitled, "Hints on Increasing the Warmth of Garden Walls by painting them black; with a Description of an Improved mode of Constructing Subdivision Walls in Gardens;" which will be published in the forthcoming part of the Caledonian Horticultural Society's Memoirs.

By the HORTICULTURAL SOCIETY OF DURHAM, NORTHUMBERLAND, AND NEWCASTLE-UPON-TYNE, to Mr. THOMAS SMITH, Corresponding Member of the Horticultural Society of London, Gardener to MATTHEW BELL, ESQ. F.H.S. at Woolsington, in Northumberland, for his various Exhibitions and Communications made within the year 1826.

By the DUMFRIES AND GALLOWAY HORTICULTURAL SOCIETY, to Mr. WILLIAM CHAMBERS, Gardener to EBENEZER STOTT, Esq. of Castle Dykes, near Dumfries, for the variety of articles produced by him in a superior style of Cultivation, and Exhibited to the Society in the year 1826; and for his great merit and industry.

By the CAMBRIDGESHIRE HORTICULTURAL SOCIETY, to Mr. JAMES DALL, Gardener to the Earl of HARDWICKE, F.H.S. at Wimpole, in Cambridgeshire, for having obtained the greatest number of Prizes from the Society within the year 1826; and for his Communications made to the Society, which have been since published in the Transactions of the Horticultural Society of London.

By the WINCHESTER HORTICULTURAL SOCIETY, to Mr. GEORGE WATSON, Gardener to the Viscount PALMERSTON, F.H.S. at Broadlands, in Hampshire, for his various Exhibitions of Fruits made to the Society in the year 1826.

LIST OF BOOKS AND OTHER ARTICLES,

PRESENTED TO THE

LIBRARY OF THE HORTICULTURAL SOCIETY,

FROM MAY 1, 1826, TO MAY 1, 1827.

WITH THE NAMES OF THE DONORS.

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Read February 6, 1827.

Sir,

The following is an account of the way I have trained, pruned, and managed the Peach trees, in the Early Peach House at Woodhall, for these last twenty-seven years.

The Peach House is forty-five feet long, and thirteen feet six inches wide; the front of the house stands on pillars; the trees are planted inside of the house, fourteen inches from the front wall. There are two nine inch courses of freestone above the border, and a sash; which, including the top and bottom wall plates of wood, makes the whole height of the front four feet six inches. A man can pass along the front, betwixt the trees and the upright sash, to prune and dress them as far as he can reach up. The trees are trained on a trellis of wood; this, at first, is three and a half feet distant from the front sash; after it passes the front sash, the trellis is parallel to the sloping glass, two feet three inches from the glass, and is continued thus to the top of the house.

There is only one flue, which coming from the back, at the east end of the house, runs along the middle of the border to the opposite end, and returns, entering into a chimney over the fire. Between the flue and the back wall, is a pit three feet deep, and four feet eight inches wide, which is kept

filled with dead leaves of trees, the steam from which contributes much to the healthiness of the trees within the house. The flue is raised nineteen inches above the border; the return flue is contiguous to the pit, being separated only by a partition of bricks on edge. The top of the flue thus doubled, being three feet wide, is covered with stone three inches thick, which forms a walk along the middle of the house.

I generally shut up the house about the first of December; if the weather be mild I apply no fire heat for two weeks, but if it be frosty I put on a little fire every night. In the course of four weeks the buds begin to swell; being at that time able to distinguish the best buds, I prune and cut away as much as possible of the wood that bore the fruit last season, and tie in the young shoots that were made in the course of the summer. These shoots were allowed to grow upright, with their tops towards the glass, through the preceding season, and were not tied down till this time. I cut out all the worst shoots, and leave none except those that are well ripened, and full of perfect and strong flower-buds; these shoots I shorten from fourteen to six inches, according to their strength, always observing to cut them at a leaf-bud. I lay in the shoots that are to bear the Peaches, from six inches to nine inches apart; after the young wood is all tied in, I go over the trees, and rub or cut off a great number of the flower-buds, carefully observing to leave the best and strongest. The few flowers that are left consequently blow very strong and perfect, and by this means, the trees not being weakened by a great quantity of bloom, I can almost count on every flower-bud which I leave, setting. When the Peaches are set, and about the size of peas, I generally give

a gentle sprinkling over the leaves with water, once every six or seven days; this I do in the forenoon, in order that the leaves may become dry before night; about the middle of March I sprinkle the trees in the afternoon, this keeps the air in the house moist and kindly through the night. The trees now beginning to make wood for next year's crop, I go over them with care, and rub off a quantity of the young shoots, observing to keep those which are left in a kind of regular order, none being preserved except where there is room for them. I do not tie in these young shoots that are left for next year's crop, but allow them to grow upright with their tops to the glass; by this means I do not crowd or disturb the shoots whereon the fruit is growing; there is sufficient of sun and air betwixt these young upright shoots to ripen the Peaches, and give them both fine colour and good flavour. As the season advances I give the trees a good sprinkling over the leaves, twice every week, betwixt four and five o'clock in the afternoon, in order that they may get the benefit of the water through the night; I continue the sprinkling while warm sunny weather continues, but if the weather happens to be dull and cloudy, I discontinue the sprinkling till warm sun returns. About two weeks after the Peaches have taken the ripening swelling, I stop the sprinkling, give the house a great deal of air, and keep no fire heat through the day; but, if the weather be dark or wet, I put on a little fire every night. If the weather happens to be warm and dry, I give the house air through the night, and no fire heat. By treating them in this way the Peaches come well coloured, well flavoured, and of a great size, few Peaches in the house being produced, less than half a pound, or eight

ounces English weight, but I have gathered several that weighed ten ounces. The trees in the house I have been describing, although they have been forced twenty-seven years, are in great good health. The sorts are the New Gallande Peach, and the Woodhall Nectarine, a seedling raised at this place; the Nectarines come the ordinary size of that fruit, a little more than half the size of the Peaches. The crop is generally fit for gathering from the middle to the end of May, and it is in general all gathered by the 12th of July; as soon as it is cleared, I give the trees a good washing of water with the engine, to stop the red spider coming on them, and after dash water over the leaves once a week, till the wood is sufficiently ripened, and the flower buds well formed; I then take off the sashes and expose the trees to the open air. They are much the better for being exposed to the weather and the rains which fall in the months of September, October, and November; about the 1st. of December, I again shut up the house, and when the flower buds are a little advanced as above stated, I proceed as before described.

I treat all the Peach and Nectarine trees that are under glass, in the same way as above; but of those that are on the open walls, the young wood must be nailed in, otherwise it would not ripen. Although I lay in the young shoots, at the time of pruning for the crop, at from six to nine inches from each other, yet I have always a very regular crop and rather thick than otherwise.

XXV. *Remarks upon the Comparative Advantages of Grafting Pears upon Quince Stocks. In a Letter to the Secretary. By Mr.* Thomas Torbron, *F. H. S. Gardener to the Countess of Bridgwater, at Ashridge, in Hertfordshire.*

Read January 2, 1827.

Sir,

For several years I have been of opinion, that perhaps there are few, or none of the sorts of fruit that come to maturity in this country, without the aid of glass and artificial heat, that merit more attention and encouragement than Pears, considering the long space of time that they may be had for the table. For where there is a judicious selection, and soil and situation suitable, they may be supplied with but little intermission, from July till May following.

One great improvement in the cultivation of the Pear, is a method practiced many years ago, but not generally enough adopted; that of the choice sorts being grafted upon the Quince, by which they come several years sooner into bearing, and produce much better crops, than those upon the common or free stock.

I have had opportunities of seeing the superiority of the Quince stock in three different counties, and with as many different sorts of soil, and have not found any disadvantage whatever in it, although some disapprove the use of it. I think the objections are made only by those who have not given the two sorts of stocks a fair trial. Pears on the Quince require less wall room at planting; but an equal

space of wall, occupied by trees on Quinces, will produce from three to five times the quantity of fruit, which could have been obtained from trees on Free stocks, and in some cases still more, and the fruit will be in no respect inferior.

In the last season, having had a general crop of fruit, I have with accuracy ascertained the difference of the produce from the two kinds of stocks, which I beg leave to submit for your information.

Gansell's Bergamot on the Quince,	2 trees.	The Quince exceeds	as 15.1 is to 1.
The same sort on the Free, -	3 trees.	the Free in quantity,	
Brown Beurrée on the Quince, -	4 trees.	The Quince exceeds	as 4.4 is to 1.
The same sort on the Free, -	3 trees.	the Free in quantity,	
Crassane on the Quince, - - -	2 trees.	The Quince exceeds	as 8.2 is to 1.
The same sort on the Free, -	2 trees.	the Free in quantity,	
Colmar on the Quince, - -	3 trees.	The Quince exceeds	as 2.8 is to 1.
The same sort on the Free, -	2 trees.	the Free in quantity,	
			30.5 4

and 30.5 divided by 4, gives 7.6 as the average in favour of the Quince.

The fruit of each of these trees was measured by gallons, and counted in numbers, each tree separately, and the space of wall occupied by each tree, was ascertained in superficial feet.

Those on the Free stocks, occupied much more wall space than those on the Quince did; but those on the Quince produced much more fruit (as above stated), than those on the Free.

Those on the Quince, were planted in 1818, 1819, and 1820, maiden trees of one years growth from the bud; they made scarcely any progress for the two first years after planting, till a more suitable soil was obtained and applied to their roots; since that they have thriven exceedingly, and produced fruit in abundance.

The Pear trees on Free stocks were all nearly eighty years old, (or coeval with the walls) and previous to 1818 extended over from forty to sixty feet of twelve-foot walls, but for several years they had been unproductive, being crowded with old wood, and long projecting spurs. They were all cut back in 1818, 1819 and 1820, nearly close to the trunk, and that was cut also down three or four feet above the surface of the ground. These trees now occupy individually, from 24 to 30 feet of the same walls, are furnished with healthy and fruitful wood, being quite renovated, and bear as much as trees of the same sorts, that were planted in good fresh soil, and against new walls, from twenty to twenty-seven years ago, and which from their age, may be said to be in their prime as to bearing.

I am, Sir,

with much respect,

your very humble servant,

THOMAS TORBRON.

Ashridge Gardens,
December 20, 1826.

Note by ALEXANDER SETON, *Esq. F. H. S.*

To the useful information contained in the above paper, I wish, chiefly with the view of calling the attention of more competent persons to the same object, to add a few remarks, arising from limited experience and observation, relating to the soils respectively adapted to Pear and Quince trees; a due attention to which will enable us to derive the greater benefit from the practice here recommended, of using stocks of the latter description. I have found that a stiff clayey

or loamy soil is generally unfavourable to Pear trees; but that Quinces and Pears grafted on Quince stocks thrive exceedingly in it. Soils of this nature being prevalent in a great many parts of this country, the means are thus afforded by the use of Quince stocks, to persons in such situations, of cultivating to advantage many varieties of Pears, which would never bear fruit in sufficient quantities, if grafted on their own species. On the other hand I have observed that in a light gravelly soil, with a gravelly or sandy bottom, Pear trees succeed better than Quinces; and in such situations the Pear stocks will of course be preferable. This if I mistake not, was experienced by the Society itself a few years ago, in the temporary experimental garden which it had at Kensington, and which consisted of a soil of the latter nature; where the Pears grafted on Quince stocks did not succeed so well as the others.

There is another point which deserves more attention than is usually bestowed on it, not only in the choice of Quince stocks, but in that of all other stocks for fruit trees; namely, the seminal varieties. It is well known, that, as all plants vary in their characters when raised from the seeds, so among their peculiarities, there is a great diversity in their vigour, and power of retaining health and luxuriance in various soils and situations. To this may often be rightly ascribed, the difference which is to be met with in the health and productiveness of grafted trees of the same variety, in the same situations. As in many cases the same variety cannot advantageously be propagated for stocks, the best course to pursue is to mark the most healthy individuals among the seedling plants. But there are other cases in which it is extremely

useful to propagate the same variety for stocks by means of layers and cuttings, as, for example, in the use of Paradise Crabs for Apples. Now, Quince trees being very easily and usually propagated by layers, it may be well worth while, for any person who cultivates them to a great extent for stocks, to select such of them as are most healthy, or possess any other useful peculiarity, and to continue those only by layers or cuttings in the same way as is usually followed with Paradise stocks, for Apples.

XXVI. *Description, with Plans of a Hot-Wall. In a Letter to the Secretary. By Mr.* John Hay, *Corresponding Member of the Horticultural Society.*

Read November 21, 1826.

Sir,

In compliance with your request, I send you an account of the hot-wall, a drawing of which I have also forwarded to you. In the early part of my practice as a professional gardener, I found that hot walls, as they are generally constructed, with four horizontal flues in the height of the wall, were objectionable for the following reasons:—viz. that the lower part of the wall became overheated before a sufficient degree of heat had been communicated to the upper part; that when the fire was withdrawn for the day, the current of cold air passing through the flues had the effect of cooling the wall, which it was necessary to correct by extra fires; and that even in summer, when the fires were discontinued, the current of cold air allowed to pass through the wall had the effect of making it colder than a solid wall heated by the rays of the sun.

Observations such as these prompted me to attempt the construction of a hot wall in which these objections might be obviated, and gave rise to the arrangement represented in the drawing. Hot walls of this description have been built in the manner shown by the transverse section, with bricks of the common size, having a shallow recess on the outside, into

which there is fitted a wooden trellis, to prevent the tree coming in contact with the wall where it is hottest, opposite the first turn of the flue. In order to avoid the wooden trellis, I have also constructed these walls on another plan, which answers the purpose equally well; and that is, by leaving a narrow space of half an inch immediately behind the first courses of bricks in front, and to the height of the first flue only, into which a stream of heated air is admitted from the top of the furnace. For the first and second turns of the horizontal flues bricks were made on purpose, viz. 9 inches long and $2\frac{1}{2}$ inches square for the first turn, and 9 inches long by 3 and $2\frac{1}{2}$ inches for the second. Double walls were built in front of the first turn of the horizontal flue of $2\frac{1}{2}$ thick, leaving a space of half an inch between them; the inner wall is built first, the bricks close laid, and the joints well pointed; the outer wall is then built, and the vacuity formed by pieces of thin board, laid close to the inner wall, which are drawn up as the building advances to the height of the first flue, where it is covered over with the large and common bricks, thus forming a narrow warm air chamber. The furnace is so constructed as to admit warm air from its sides and top into the chamber, and obtains vent at the end furthest from the furnace by a cast-iron plug and socket, half an inch in diameter, built into the wall, which, by being kept in or withdrawn at pleasure, puts it in the gardener's power either to reduce or keep up the temperature of this part of the wall. A sketch of this shown on a transverse section is also given. Some gardeners prefer this method to the other. It may be mentioned as an advantage, that stronger fires may be kept on without risk of injuring the trees that may be

trained upon the wall. In every other respect the wall is the same, only the thickness in front of the upper horizontal flue is three inches. The furnace is provided with an outer and inner cast-iron door, and ash-pit door, and the outlet of the flues with a cast-iron chimney top, having a lifting damper. In heating the wall the furnace door is always kept close, except when feeding the fire; the ashpit door being allowed to stand open as much as to make the fire burn to the extent required. When the wall has been brought to the proper temperature, the damper on the chimney top is let down, and the ash-pit door closed; a few red embers shut up in the furnace will assist in preserving the heat, which may thus be maintained for a considerable time, and a saving of fuel effected. In summer all the furnace doors are to be kept close, and the top dampers let down. For a further description of these plans I beg to refer you to the particular references which accompany them.

I am, Sir,

Your most obedient Servant,

JOHN HAY.

Edinburgh,
July 15, 1826.

References to the annexed Plan, and Sections.

Fig. 1. The ground plan. One side A has a recess for a wooden trellis, the other side B is without a trellis, but has in lieu of it a warm air flue *a*. The furnaces, flues, cleaning holes, &c. are shown. *b b*, are holes three inches square, at the level of the fire bars,

Fig. 3.

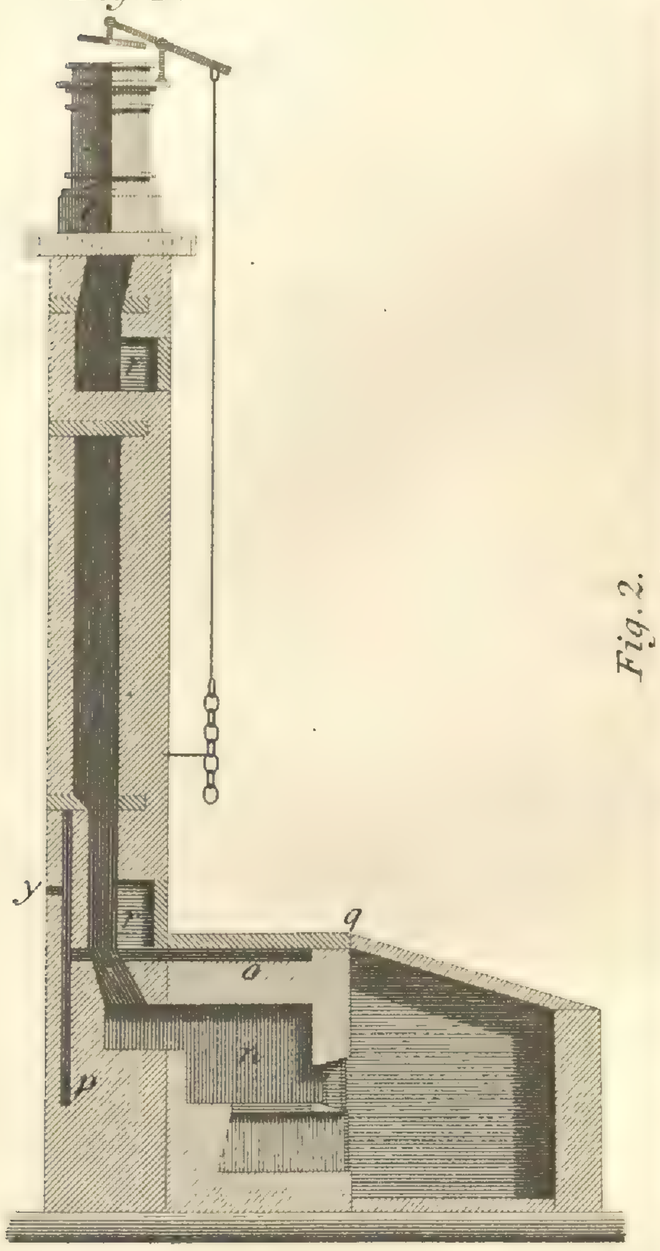


Fig. 4.

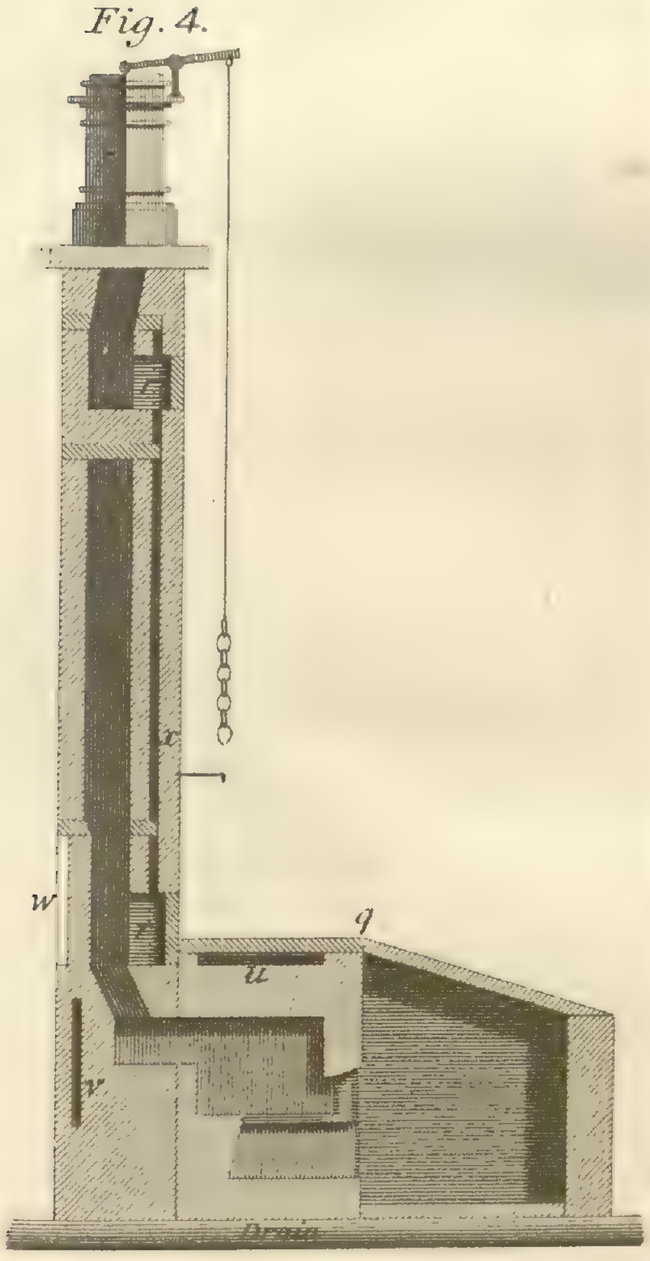


Fig. 2.

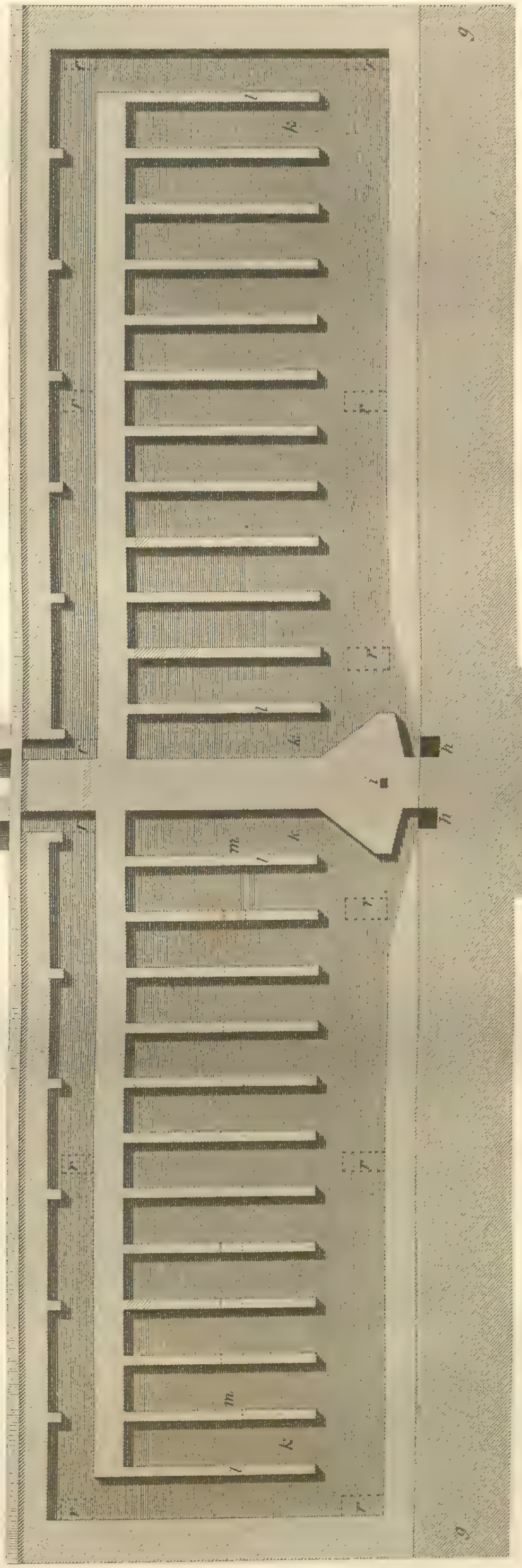
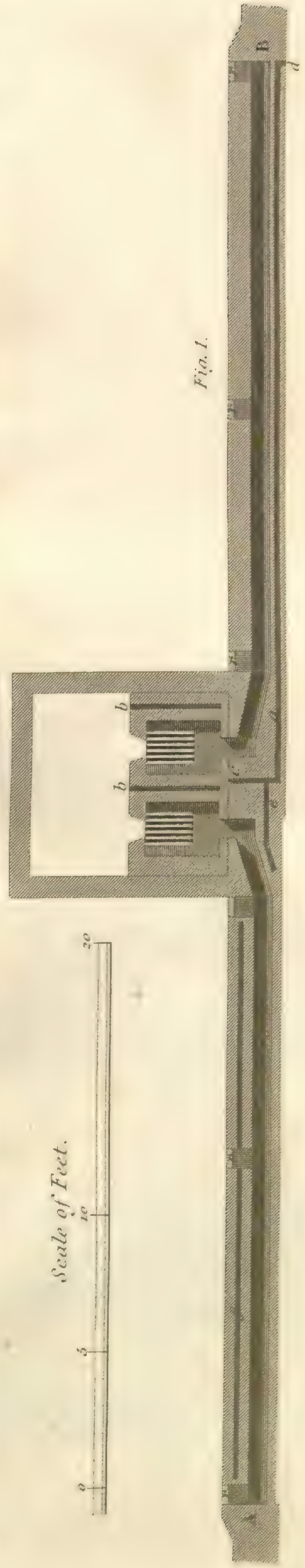


Fig. 1.



Plan of a Hot Wall by Mr. John Hay

where the vacuity extending up the sides, and over the arch of the furnaces, commences. These openings are furnished with plugs, and are for the purpose of admitting cold air, to be heated by coming in contact with the warm parts of the furnace.

c, Warm air from the top of the furnace, passing through the air flue in the lower part of the wall, and escaping at *d* (*y* Fig. 3), where there is fixed a square piece of cast iron, having a socket in the centre and brass plug to fit, secured by a bit of chain. These plugs are withdrawn when the furnace is heated, permitting a current of warm air to pass forward, which assists in warming the outer wall. When the fire is taken off, the plugs are replaced in their sockets.

e, a vacuity in the wall A, similar to the air flue in the wall B, just described, and connected with it, to prevent any overheating of this part of the wall.

f, a narrow vacuity extending nearly to the top, for the purpose of checking the expenditure of heat upon the north or back part of the wall, and to preserve the heat as long as possible on that side of the flue.

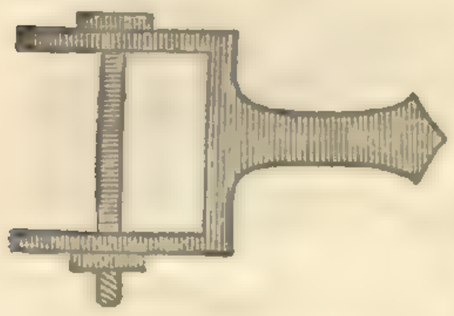
Fig. 2. Longitudinal section; *g g*, foundation; *h h*, entrance to the smoke flues; *i*, passage for heated air from the top of the furnace to warm the air flue (*c*, Fig. 1) in the front of the wall; *k k*, chambers connected with the smoke flue for the purpose of retaining the heat, formed by laying two bricks in length; *l l*, divisions separating the chambers, formed of bricks laid in breadth. When a hot wall of this description is built upon a level, openings might be left in the middle

of each division, except that furthest from the furnace, as at *m m*, which by permitting the warm air accumulated at the extremity nearest the furnace to diffuse itself, will tend to render the heat communicated to the exterior surface more uniform.

Fig. 3. Transverse section of the wall as at B (Fig. 1); *n*, furnace with a double iron, and an ash-pit door; *o*, air flue on the top of the furnace, covered with a flag stone, and connected with the air flue *p*, corresponding with *c*, (Fig. 1.) A wooden hatch hinged at *q*, to the flag stone, covers the furnace pit, *r r* (in this and the other figures) cleaning holes closed with bricks; *s*, square cast iron chimney top, set diagonally to the line of the wall, having a lifting damper, and a wire and ring, or chain attached, by pulling down which the damper is raised, and the ring, or link of chain slipped upon a hook fixed in the wall, keeps it in its place; *t*, square stone bases, to which the chimney top is secured.

Fig. 4. Transverse section of the wall as at A (Fig. 1); *u*, a space left between the arch and flag-stone cover of the furnace, to prevent the escape of heat; *v*, vacuity opposite the furnace, corresponding with *e* (Fig. 1); *w*, a recess on the outside of the wall in front of the first turn of the smoke flue, $1\frac{1}{8}$ inch deep, fitted with a wooden trellis, to which the branches of the trees are trained. The rods of this trellis are kept three-eighths of an inch free of the wall, to permit of tying; *x*, narrow chamber, as described at *f* (Fig. 1.)

Some walls in high and exposed situations have been furnished with screens. For this purpose, wrought iron forked



bats, as in the adjoining sketch, are fixed in the front of the wall, at $2\frac{1}{2}$ inches beneath the coping, and 35 inches distant, to receive the upper ends of moveable rafters, the tops of which are furnished with small pulleys or rollers. A screen of thin osnaburgh or canvas, all in one piece, is provided for each division of the wall, bound round the edge with small rope or cord. A small rope for each rafter is fixed to the screen; these being passed through the pulleys, a man placed at each end of the screen, having the ends of half the ropes in his hand, easily brings it up to the top of the wall, where it is fixed for the night, and in the morning let down nearly to the ground. Two ropes for each rafter attached at the top of the screen, crossing one another on the outside, bind it close to the rafters. This kind of covering has been successfully used upon hot and other walls, for protecting the trees when necessary in spring or autumn.

XXVII. *Report upon the New or Rare Plants which flowered in the Garden of the Horticultural Society at Chiswick, between March,* 1825, *and March,* 1826. *Part* II. *Hardy Plants. By Mr.* JOHN LINDLEY, *F.L.S. &c. Assistant Secretary.*

Read September 4th and 18th, 1827.

THE following observations apply to such Hardy Plants as flowered in the Garden of the Society between March, 1825, and March, 1826, and appeared to merit particular notice. A Report upon the Tender Plants that flowered in the same period has already been printed in the present volume of the Transactions.*

TREES OR SHRUBS.

XXXIV. Rosa Dicksoni.

R. (*Cinnamomea*) ramis flexuosis aculeis raris gracilibus sparsis armatis, foliolis complicatis grossè duplicato-serratis inæqualibus, stipulis petiolis sepalisque glandulosis æqualibus, fructu nudo.

Amongst the multitude of Roses that have been distinguished by botanists of almost every nation of Europe, it is scarcely credible, that in our own country, there should still exist a species, which even the most sceptical of those who have studied the genus are ready to admit as a distinct form: yet such is the fact with the plant now about to be described. It was sent to the Society in 1824 by Mr. JAMES DRUMMOND, Curator of the Botanic Garden, Cork, by whom it was discovered.

* P. 46.

With other British species it has so little in common, that there is not one with which it is necessary to compare it. Of the Roses not found wild in these islands there are two, namely, R. cinnamomea and R. villosa of Linnæus, each the representative of a particular group of species, to which it is almost equally allied; to the former however in a greater degree than to the latter. With R. cinnamomea it agrees in the colour of its wood, in the form of its setæ, in the colour and general appearance of its foliage, in the form of the tube of the calyx, and in the smoothness and figure of the fruit; but it disagrees with it in its glandular regular sepals, more robust habit, and glandular petioles and stipules. To R. villosa it approaches in the form and serratures of the leaves, in the glandular surface of the sepals, and very much in its general appearance; but it recedes from that species in not having any tendency to produce spines on the fruit, in its uniformly regular equal sepals, in the texture and direction of the leaflets; and finally, in the total absence of that peculiar smell of turpentine which pervades the whole of the division of Villosæ Roses.

At the suggestion of Mr. Sabine it has received its name in record of the merits of the late Mr. James Dickson, a Vice President of this Society, and an indefatigable investigator of British Botany.

The following description may possibly appear tedious; but by those who are acquainted with the difficulty of distinguishing species in this most intricate genus, it will not be found more copious than is necessary. Bush, with the habit and general appearance of an upright growing R. cinnamomea. Young shoots light green, very slightly tinged with brown,

furnished with a few scattered, slightly falcate, somewhat unequal, slender prickles. Old shoots flexuose, dark purplish brown, covered all over with a light glaucous bloom, with a very few scattered, straight, slender prickles; sometimes unarmed. Leaves large, grey, opaque; stipules large, broad, apiculate and slightly serrate at the end, downy, ciliated with fine glands, which exist also at the back near the edges; petioles downy, unarmed, with a few glands on the upper surface; leaflets oval, complicate, coarsely and doubly serrated, downy on both sides, and having a very few minute glands beneath; there is no smell of turpentine; terminal leaflet much larger than the lower leafllets. Flowers in 5-flowered cymes. Bracteæ downy, glandular at the edge and back, the lowermost usually with a long terminal leaflet as long as the tube of the calyx. Peduncle setose. Tube of the calyx ovate, glaucous, naked, or rarely with a few setæ; sepals setose and glandular at the back, long, narrow, all nearly equal, with a long linear-lanceolate leafy serrated end. Flowers dark red, middle sized, appearing in June. Petals entire, emarginate, apiculate, much shorter than the sepals. Stigmas in a depressed head, hairy. Fruit red, unarmed.

XXXV. Rosa Banksiæ; *Garden variety*, flava.

A very handsome variety of Rosa Banksiæ, brought from China for the Society in 1824 in the Lowther Castle East Indiaman, by Mr. John Damper Parks. Besides colour, it differs from the double white variety in having shorter, flatter, and more lucid leaves, and in having less disposition to produce side branchlets. The flowers are smaller and not fragrant, and the petals are arranged with greater regularity one

above the other; the latter are quite entire. The sepals are very distinctly tinged with red, and are not glandular.

This variety flowers in the open air in the beginning of May, about a fortnight earlier than the common sort. It is perfectly hardy, and propagates with the greatest facility from cuttings.

I am informed by Dr. LIVINGSTONE, that both the varieties of Rosa Banksiæ are found in China to strike so freely from cuttings, that it is a common practice with the Chinese gardeners, to engraft a cutting of R. Banksiæ with any other kind that they wish to encrease, and then to plant the cutting so grafted; they find that it possesses so much inherent vigour, that it is able both to strike root itself, and to form as perfect a union with the scion as if it had been a growing plant.

XXXVI. Rosa Alpina; *Garden variety*, speciosa.

This remarkable variety appears to be a hybrid production, between Rosa Alpina and Rosa Indica. To the former it approaches in being destitute of prickles, in the blistered surface of its young leaves, and in the general habit. To the latter it may be compared on account of its clustered flowers, and the form, crimson tinge, and glossiness of its foliage.

It is a low bush, with vigorous, erect, nearly naked, vinous shoots, covered with a glaucous bloom. The branches are nearly unarmed, bearing occasionally a few straight, scattered prickles. The leaflets are oval, somewhat shining, and simply serrated; their stipules much dilated, and their midrib strongly coloured with red. The flowers are semi-double,

with somewhat loose flaccid petals, of a very brilliant carmine, fading into pale rose colour as the blossoms approach decay. The peduncles are slightly glandular; the tube of the calyx ovate, smooth, and the sepals nearly simple, not quite so long as the petals, and coarsely covered with minute glands.

This was raised by Mr. James Drummond of Cork, by whom plants were sent to the Society's Garden in 1824. The flowers appear in June and July. It has been distributed from the Garden under the name of Drummond's Thornless Rose. It is one of the earliest Roses that blow, and one of the most striking.

XXXVII. Pyrus arbutifolia.

P. caule erecto, foliis obovato-oblongis acutis subtus calycibusque tomentosis, corymbis paucifloris foliis brevioribus, fructibus pyriformibus.

Under this name several different plants are cultivated, which it appears to me necessary to distinguish. Of these, three may be considered varieties of P. arbutifolia, and two essentially distinct species, one of which has been published as such in the Botanical Register. Under P. arbutifolia Botanists comprehend all the plants with downy calyces that are referable to that section of Pyrus which Persoon called Aronia, and which has been more recently distinguished by the name of Adenorachis by M. De Candolle. Which particular variety of this species, or whether either of the two others I am about to characterize, have been intended by various Botanists for their P. arbutifolia, I do not think it is possible to ascertain. I shall therefore assume that the plants to which that name is truly applicable are characterized as follows. Stem erect, naked. Branches chocolate

coloured. Leaves small, pale green, oval, acuminate at each end, a little narrower towards the base, smooth above, downy beneath, with very fine crenatures, each having a little brown mucro. Flowers numerous, in many flowered corymbs. Calyces downy. Fruit red, shining, produced in considerable abundance, small, obovate, slightly downy.

This was presented by Messrs. LODDIGES under the name of Mespilus pyrifolia. It varies slightly in the size of its fruit, and in its more or less vigorous growth. From it I distinguish the two following varieties.

P. arbutifolia, β *intermedia:* fructu subgloboso fusco.

A handsome plant, received from Mr. WILLIAM MALCOLM, under the name of Pyrus melanocarpa. It cannot be ranked higher than a variety of Pyrus arbutifolia, with which it agrees in the surface of its calyx, and the shape of its leaves, differing chiefly in the size and colour of its fruit, which assumes a brown hue when fully ripe, and in the larger size of its leaves.

P. arbutifolia, γ *serotina:* foliis nitidis subtus velutinis, fructu serotino versicolore.

The leaves of this are of a darker green than those of the type of the species, more tapering to each end, and particularly shining on the upper surface; they are also much more reticulated above than in either of the other two varieties; the fruit is pyriform, changing at first to yellow, and afterwards acquiring the red colour proper to the species.

XXXVIII. Pyrus floribunda. *Lindley.*

P. ramis cinereis reclinatis, foliis oblongo-lanceolatis acutis longè petiolatis subtus calycibusque tomentosis, fructibus sphæricis, corymbis multifloris foliis longioribus.

This species differs from P. arbutifolia in its compact reclinate habit, and black fruit: in P. arbutifolia the mode of growth being erect and rather rigid, and the fruit red. The leaves have nearly the same outline, but are not netted on the upper side, are much larger, and are seated on longer stalks; the young shoots are long and cinereous. The appearance of the plant is unusually graceful, and it is, to use an Horticultural expression, by far the best plant of any of the allies of P. arbutifolia. It is intermediate in appearance between P. melanocarpa and arbutifolia, agreeing with the latter in its calyces, with the former in its fruit, and being truly distinct from either.

The plants in the Garden were presented to the Society by Messrs. Loddiges, under the name of Mespilus floribunda. It has long been an inhabitant of the Gardens; for there are specimens in the Banksian Herbarium from the Gardens both of Mr. Peter Collinson and Dr. Fothergill. A figure of the plants in the Society's Garden has been published in the Botanical Register. fol. 1006.

XXXIX. Pyrus depressa.

P. caule humili reclinato, foliis oblongis obtusis subtus calycibusque tomentosis, fructibus pyriformibus, corymbis foliorum longitudine.

In habit this is similar to P. melanocarpa, being very dwarf; the plants in the Garden do not exceed $1\frac{1}{2}$ foot in height.

The branches are reclinate, cinereous, rather chocolate coloured, with very short branchlets. The leaves are small, oblong, rounded at the apex, with very fine crenatures, shining above, downy beneath. The corymbs are not longer than the leaves, and extremely numerous, giving the plant when in flower a lively appearance. The fruit is very small, numerous, downy, dark purple, nearly round.

Received from Messrs. LODDIGES, under the name of Pyrus prunifolia, a very different arborescent species.

XL. Pyrus melanocarpa.

P. caule humili erecto glabro, foliis oblongis acutis nitidis glaberrimis subeglandulosis mox discoloribus, fructibus rotundato-turbinatis calycibusque glaberrimis.

This is generally known in the nurseries by the name of Mespilus montana; it has also been received from Messrs. LODDIGES and Messrs. WHITLEY and Co. under the name of Pyrus Pensylvanica. The habit is very dwarf, not exceeding $1\frac{1}{2}$ foot or 2 feet in height. The branches are erect, always smooth. Leaves pale green, obovate, or oblong, acute, coarsely crenated, with scarcely any glands either upon the margin or costa, changing to deep red as the season advances. Flowers smaller than in the species with downy calyces. Calyces smooth, as also is the fruit, which is roundish-turbinate, black and shining. The buds and shoots are often bright red.

Most nearly related to P. depressa, from which it differs in having smooth calyces, leaves and branches, a more erect habit, and scarcely any glands upon either the margin or

middle of the leaves. It is altogether an extremely smooth plant.

Of this there is a variety named in Messrs. Loddiges' Catalogue Mespilus xanthocarpa, which differs in having the young leaves downy beneath, and the flowers rather smaller. Its habit also appears to be less dwarf. I have not seen the fruit, which from the name is possibly yellow: it must not be confounded with the true P. melanocarpa, but may be distinguished as a variety thus.

P. melanocarpa, β *subpubescens:* foliis junioribus subtus tomentosis adultis glabris, corymbis paucifloris.

According to native specimens in my possession, collected by the late Mr. Frazer, this variety is a native of the Southern States of North America.

XLI. Pyrus pubens.

P. caule erecto, ramis pubescentibus, foliis oblongis obovatisve abruptè acuminatis, fructibus sphericis calycibusque glaberrimis, corymbis polycarpis laxis, disco glabro.

A handsome species, most nearly related to Pyrus grandifolia, from which it is at first sight known by its very cinereous branches, and much smaller leaves. Received under the name of Pyrus capitata from Mr. John Miller of Bristol, by whom it was some years since obtained from the late Mr. Lyons.

Stem erect, vigorous. Branches cinereous, downy. Leaves oblong or obovate, abruptly acuminate, tapering to the base, pale green, crenate, nearly without glands, smooth on each side. Corymbs numerous, many flowered, shorter than the leaves. Calyces quite smooth. Fruit large, dark purple,

round, shining, in loose corymbs. Disk and apex of the ovarium nearly smooth.

Both this and the next have the robust foliage and habit of Pyrus Chamæmespilus.

XLII. Pyrus grandifolia.

P. caule erecto ramisque glabriusculis, foliis oblongis obovatisve acutis glabris, fructibus sphæricis calycibusque glabris, corymbis oligocarpis coarctatis, disco villoso.

A very fine and distinct plant, received from Mr. JOHN MILLER of Bristol, by whom it was obtained under the same circumstances as the last. It resembles a P. Chamæmespilus in the strength of its shoots, breadth of its leaves, and general appearance.

Stem erect, vigorous. Branches brown, slightly pubescent. Leaves large, bright green, broad, oblong or obovate, abruptly acuminate, smooth on each side, shining above, serrulate, with few glands. Flowers larger than usual. Fruit dark purple. Calyces quite smooth. Disk and apex of the ovarium villous.

It is difficult to find technical characters to discriminate this and the last, which are nevertheless truly different. I believe the villous disk and apex of the ovarium of this is as constant, as it is an obvious character; its branches are also much less downy, the leaves browner and larger, and the corymbs of fruit more compact. It may be considered the transition from the tribe of Adenorachis to that of true Pyrus.

XLIII. Pyrus Aria. *Ehrhart.*

Of the many varieties of this tree differing from each other in the figure and general appearance of their foliage, few have been yet distinguished either in systematic works, or catalogues of cultivators; it may therefore be useful here to notice such of them as are growing in the Garden of the Society.

1. P. Aria, *obtusifolia;* foliis planis ovalibus obtusis simpliciter serratis: adultis suprà glabris.

P. Aria obtusifolia. Dec. prodr.
P. Aria ovalis. Hort.

Buds green, small. Shoots weak, smooth. Leaves regularly and simply serrated, obtuse at each end, very even and glossy above, hoary beneath.

This differs from P. Aria angustifolia chiefly in the glossiness and shortness of the leaves. It is well represented in the Flora Danica, plate 302, where it is stated to be common in Norway. It was received from Mrs. Mackie of Norwich, under the name of *P. Aria ovalis.*

2. P. Aria, *undulata;* foliis planis ovali-lanceolatis latis undulatis inæqualiter inciso-serratis acuminatis: adultis suprà araneosis.

Buds very large, greenish brown. Shoots stiff, greenish brown. Leaves approaching those of P. intermedia in form, but white, with down beneath, and when young densely downy on the upper side; they are usually uneven or undulated. Corymbs large, with flowers expanding fully.

Received from Mr. Ronalds of Brentford, under the name of *P. Aria.*

3. P. Aria, *angustifolia;* foliis ovalibus obtusis concavis subsimpliciter serratis: adultis suprà hic illic lanatis.

Buds large, cinereous. Shoots smooth. Leaves small, simply serrated, obtuse at the point, cuneate at the base, very white beneath, and slightly downy above. Received from M. GODEFROY of Ville d'Avray, near Sevres, under the name here adopted.

4. P. Aria *acutifolia;* foliis ovalibus rigidis utrinque acutis concavis duplicato-serratis cæsiis, suprà araneosis.

P. Aria acutifolia. Dec. prodr.

Buds large, cinereous. Shoots smooth. Leaves flat, nearly simply serrated, cuneate and entire at the base, with a very cæsious aspect; slightly woolly on the upper surface. Corymbs, flowers, and fruit, smaller than usual.

To this M. DE CANDOLLE refers Pyrus alpina of WILDENOW (*Enum.* 527), in which he is probably correct, as its flowers and fruit are smaller than those of many states of P. aria. It is common in many parts of Europe; I have it from woods near Buda.

5. P. Aria, *rugosa;* foliis magnis ovato-ellipticis duplicato-serratis supra lucidis rugosis subtus niveis.

Buds very large, greenish brown. Shoots very strong, smooth. Leaves large, on slender petioles, always obtuse, generally elliptical, but frequently assuming an ovate outline; the serratures are regularly double; the upper surface glossy, dark green, uneven, and wholly destitute of down, except on the youngest leaves, where it has a floccose appearance; it is shed long before the leaf has attained its full size;

the under surface is as white as that of P. edulis. A very distinct variety.

Received from Messrs. Loddiges under the name of *P. Aria.*

6. P. Aria *Cretica;* foliis planis orbiculato-ellipticis crenato-serratis retusis basi cuneatis, ramulis araneosis.

P. Aria rotundifolia. Hort.
P. Aria Cretica. Hort.
P. Græca. Hort.

Buds large, brown. Shoots smooth; when young slightly covered with a cobweb-like down. Leaves flat, middle sized, obovate-cuneate, doubly serrate, entire at the base, smooth above, hoary beneath.

This variety is nearly the same as the Caucasean form of the species, which differs in having the serratures of the leaves double, and their upper surface loosely covered with woolliness; the latter I have not yet seen in cultivation. It also exhibits an approach to P. edulis of Wildenow, commonly sold in the nurseries under the name of P. nivalis, which M. De Candolle has referred to P. intermedia, but which appears to me to constitute a species quite as legitimate as any of those into which the old P. Aria has been divided.

Received from Messrs. Loddiges under the name of *Pyrus Græca,* and from Messrs. Backhouse of York as *P. Aria rotundifolia.* It is more commonly known in the nurseries by the name of *P. Aria Cretica.*

7. P. Aria *bullata;* foliis concavis ellipticis acuminatis bullatis, apice grossè serratis, basi integris.

P. Aria acuminata. Hort.

Buds small, downy. Shoots weak, downy. Leaves on long stalks, irregularly but not doubly serrated, acuminate towards

the point, very much puckered, covered with soft down beneath, but scarcely hoary; they bear much resemblance to the leaves of some varieties of P. Malus. Received from Messrs. BACKHOUSE of York under the name of *Pyrus Aria acuminata.*

The figure of Pyrus Aria in English Botany, which it might have been expected would have been found referable to some one of the above varieties, appears to me not to represent any form of that species, but a state of P. intermedia which is common to all the north of Europe, and which M. FRIES has called Sorbus Scandica. It may be presumed that it was this opinion which induced M. DE CANDOLLE in his Prodromus not to identify the figure with either of his varieties of P. Aria.

XLIV. Ulex Europæus; double variety.

This in its foliage resembles in all respects the common Furze of this country, but its habit is more compact. It forms a very dense bush, about 5 feet high, and 7 or 8 wide. The blossoms are produced in great profusion, remain a long time expanded, and are completely double: a singular circumstance in a leguminous plant. In this curious multiplication of the parts of the flowers the calyx is not affected, and the vexillum, alæ and carina, retain their primitive form, but are forced asunder by the increase in number of the organs surrounding the axis. Neither stamens nor ovarium are produced, but in their stead there is an additional number of petals which usurp their places. In the room of the upper stamen, or of that which in a naturally formed flower is separate from the others, is produced a petal entirely resembling the vexillum, except that it is smaller; in like manner other

additional petals assume the place of the remaining stamens, taking the likeness of those petals to which they stand next. The ovarium is also represented by a petal, the middle nerve of which answering to the back of the pod is hairy and discoloured, and the edges answering to the placenta are coloured and petaloid.

Plants were presented to the Society by Mr. JOHN MILLER of Bristol in whose nursery it was first raised. It has also been received from Mr. FALLA of Newcastle.

XLV. Prunus serrulata.

P. foliis obovatis acuminatis setaceo-serrulatis glaberrimis, petiolis glandulosis, floribus fasciculatis.

This species was sent to the Society from China by Mr. REEVES in 1822, under the name of Yung-to; and in the same year was presented by Mr. SAMUEL BROOKES, by whom it had also been imported. It is usually known by the name of the Double Chinese Cherry. It is a handsome plant, resembling the common cherry, from which it differs in the outline of its leaves, in their surface, and in the nature of the serratures, which are very fine and bristle pointed. In general appearance the foliage is particularly glossy. The flowers appear in April in great abundance; they are of a clear transparent white; the petals are numerous, and disposed one above the other in such a way as to preserve the pentagonal or quinary arrangement that exists in the single flower. When the flowers are produced in the open air they acquire a beautiful tinge of pink.

One of the plants in the Arboretum of the Society's Garden died during the winter of 1825-6, but as others have in other

places in the Garden exhibited no perceptible impatience of cold, it may be inferred that the plant alluded to perished from some unknown cause, and not from frost.

One of the most ornamental hardy plants with which I am acquainted, and far more beautiful than any of the double Cherries commonly in cultivation.

XLVI. Prunus salicina.

P. floribus subsolitariis foliis brevioribus, foliis obovatis acuminatis glanduloso-serratis glabris, stipulis subulatis glandulosis petioli longitudine, petiolis eglandulosis, ramis inermibus.

This, which is commonly called the Chinese plum, was originally sent by Mr. REEVES from China to the Society in 1822, under the name of the Ching-Cho-Lee, or Tsing-chok-Lee Plum. It is not referable to any of the species hitherto published, but seems to bear a close affinity to the Prunus glandulosa, a Japanese plant described by THUNBERG, which has pink flowers and strongly reticulated leaves with an oblong outline.

The plants in the Garden are either in pots in a forcing house, or trained against a south wall; in these situations the shoots are glaucous-green, slender, and free from spines. Leaves of rather a thinner texture than those of the common Plum, obovate, acuminate, finely serrulate, each serrature being tipped with a minute semitransparent yellowish gland; beneath they are quite smooth and slightly reticulated; above, glossy and rugulose. Petioles short, without glands. Stipules as long as the petioles, subulate, persistent, frequently pinnatifid at the base, fringed with glands like those of the leaves. Flowers small, white, growing singly or several together, on short footstalks, perfectly smooth. Divisions of

the calyx ovate not glandular. The fruit is represented in Chinese drawings to be about the size and colour of the Myrobalan Plum, or Prunus cerasifera.

XLVII. Ribes aureum. *Pursh.*

Under this name there are confounded in Gardens two distinct species, and several remarkable varieties, which differ not so much in general appearance, as in their respective periods of flowering, in the shape and quality of their fruit, and the manner in which their foliage is affected by change of season. I will first distinguish the varieties which I consider referable to R. aureum, and then give some account of the species that has been confounded with it.

The plant, which is figured in the Botanical Register, plate 125, may be considered the original form of the species. This, which is the earliest that flowers, and which I call *R. aureum præcox*, is perhaps the best of the varieties. Its leaves are downy beneath, almost always wedge shaped at the base, especially in the early part of the season, and the lobes of the leaves are coarsely cut. The racemes of flowers are furnished with long leafy persistent bracteæ. The fruit is produced in great abundance about the middle of July. The berries are obovate or turbinate, black, about the size of the Common Black Currant, and contain a greenish yellow dense mucilaginous pulp, with a strong disagreable flavour. Plants of this variety are occasionally to be obtained in the French and English Nurseries under the false name of R. orientale, but it is far from being common.

The second variety, *R. aureum serotinum*, is more common in the Nurseries than the last, from which it is distinguished

by its flowering and fruiting from ten days to a fortnight later. The leaves are smoother beneath, for the most part truncate at the base, not cuneate, especially when they are three lobed. The Flowers are the same as the last but the bracteæ are smaller and deciduous, so that the racemes of fruit are destitute of foliage. The latter are less abundant than in the first variety; and the berries are spherical not turbinate but they have the same vapid unpleasant flavour.

The third variety *R. aureum sanguineum* was presented to the Society by Mr. MICHAEL FLOY of New York under the name of the Scarlet Missouri Currant. The flowers appear at the same time as those of *R. aureum serotinum* which it most nearly resembles, but it is at once distinguished from it by the circumstance of its leaves becoming in the autumn of a deep scarlet colour. The fruit is large and spherical, and supported by large persistent bracteæ. The flavour of the berries is much better in this variety than in either of the others, having sufficient acidity to remove the mawkish taste which prevails so far in every variety of R. aureum,* as to throw doubt upon the statement given by PURSH of the great excellence of the fruit of the wild plant.

To bring the differences between these three varieties more distinctly into view the following differential characters will be useful.

* Since this paper was read, Mr. DOUGLAS has returned from his expedition to the North West of North America, the native country of Ribes aureum; and from him I learn that the fruit, of which so much has been expected, if produced upon plants, growing in rich alluvial land is uniformly worthless, but that upon high dry limestone rocks it acquires a quality of great excellence.

R. aureum, *α præcox;* floribus præcocibus, foliis basi cuneatis subtus pubescentibus: lobis grossè inciso-serratis, baccis copiosis præcocibus turbinatis, racemis bracteatis.

R. aureum, *β serotinum;* floribus serotinis, foliis heteromorphis basi truncatis subtus glabriusculis: lobis inciso-serratis, baccis raris serotinis sphæricis, racemis nudis.

R. aureum, *γ sanguineum;* floribus serotinis, foliis basi truncatis mox sanguineis, baccis copiosis sphæricis, racemis bracteatis.

The plant to which allusion is above made, as a distinct species confounded with R. aureum, was purchased by the Society in 1824 from Mr. William Prince, of New York, under the name of Lewis's yellow fruited currant.* Of this I now proceed to give some account as

XLVIII. Ribes tenuiflorum.

R. inerme, foliis subrotundis trilobis farinosis mox glaberrimis cruentis: lobis apice obtuse dentatis, racemis pendulis multifloris, calycibus tubulatis glabris pedicello longioribus coloratis, petalis integerrimis calycis laciniis linearibus obtusis duplò brevioribus, baccis glabris.

In habit this species is more erect than R. aureum, and has the young wood more thinly clothed with leaves: its whole appearance is also paler during the early part of the year; in the autumn the foliage becomes deep crimson, and the bush extremely ornamental. The leaves are nearly round, 3-or 5-lobed, when young covered with a kind of mealy bloom, when more advanced cordate at the base, and at all times, in the plants that I have examined, wholly destitute of pubescence. The

* While this Paper was in the press, M. Colla's Third Appendix to his Catalogue of the Plants, cultivated in his garden at Ripuli, came to my hand. In this work I find my R. aureum sanguineum considered a distinct species, and figured (tab. 1. fig. B.) under the name of R. flavum, and, what appears to be the plant above-named R. tenuiflorum represented as the original type of R. aureum; an opinion in which I cannot concur.

flowers are not more than half the size of those of R. aureum, and have entire, not notched petals. The fruit is the size of the Red Currant, with a thick skin, and a dense mucilaginous pulp of an agreeable flavour, but possessing little acidity, and far inferior to our cultivated Currants. The berries ripen about the middle of July.

There are two varieties, the one bearing black, and the other yellow fruit; the former changes from yellow to red, and finally acquires a deep blackish purple hue; the latter always retains its yellow colour.

XLIX. Ribes setosum.

R. ramis densè setosis, aculeis inæqualibus subulatis, foliis subrotundis basi cordatis pubescentibus 3-5-lobis altè crenatis, pedunculis bifloris subebracteatis, calycibus tubulato-campanulatis. laciniis linearibus obtusis patentibus petalis integerrimis duplò longioribus, baccis hispidis.

Plants of this undescribed Ribes were presented to the Society by Messrs. LODDIGES with the name of the Missouri Gooseberry. It is a low bush, having its branches densely covered with setæ, among which, particularly about the bases of the young branches, are intermixed many unequal, straight, subulate aculei. The leaves are roundish, deeply cordate, covered, as well as their stalks, with a minute glandular pubescence; the margin is 3-or 5-lobed or angled, with numerous, nearly equal, rounded incisions. The flowers are white, tubular, and about half as long as those of R. aureum, appearing in pairs, and hanging in profusion from beneath the branches. Berries black, spherical and hispid, with a subacid, pleasant flavour, a little partaking of musk.

This is a very desirable species, and although not so showy as the long-flowered American Currants with coloured

calyces, is by far the most ornamental of all the Gooseberries yet in our Gardens. The fruit possesses no merit; it ripens in July.*

L. Ribes alpinum; *variety*, pumilum.

This is in all respects like R. alpinum, except that it is not above one-third of the size of that species. Its appearance is that of a very stunted plant, but the regularity of its growth, and the hardy nature of the leaves and branches, which are never injured by weather, render it a desirable shrub. It never exceeds three feet in height. It was presented to the Society by Mr. John Miller of the Bristol Nursery, where it has long been cultivated. Its origin is not known.

LI. Caprifolium Douglasii.

C. foliis ovalibus utrinque acutis petiolatis glabris ciliatis subtus tomentosis: summis connatis, floribus capitato-spicatis pilosis, stigmate exserto, staminibus inclusis.

This fine new species of Honeysuckle is a native of Canada, whence living plants were brought for the Society by Mr. Douglas in the spring of 1824, on his return from his first visit to North America. It is quite hardy, and produces its flowers in July.

From Caprifolium pubescens it differs in having smooth, darkly coloured branches, and very large, stalked, broad, elliptical, pointed, rugose leaves, which are dark green, and smooth above, and soft with down beneath. The upper leaves are connate, and less downy beneath. The heads of

* Since this Paper was read, I have learned from Mr. Douglas, by whom dried specimens have been brought home, that it is a native of the banks of the Sascatchewan River in North America.

flowers grow in threes, and are nearly sessile in the bosom of the upper leaves. The corolla is pubescent, downy, and yellow on the outside, bright orange inside; the upper lip erect, 4-lobed, with round lobes, the lateral ones being reflexed; the lower spatulate, and concave at the end, but convex towards the base. The stamens are shorter than the corolla. The stigma large, green, and capitate.

To C. ciliosum of PURSH this has also considerable affinity. It differs from that species as it does from C. pubescens, in having its stamens not exserted, but included within the tube of the corolla, and also in the much greater length of its style. It is besides distinguished by its leaves not being smooth and glaucous beneath, by its flowers not being sessile or nearly so in the bosom of the connate leaves, and by the corolla being more ringent and less inflated in the tube.

The fine foliage of this species, some of the leaves of which measure 6 or 7 inches in length, and are of a deep glossy green colour, render it one of the most desirable of the Caprifolium tribe.

LII. Anagyris Indica.

A. foliolis lanceolatis subsericeis acutis supra lucidis.

Virgilia sericea. Hort.
Thermopsis laburnifolia. D. Don.
Thermopsis Nepalensis. Decandolle.
Baptisia? Nepalensis. Hooker.

Seeds of this plant were originally received from India under the name of Virgilia sericea: it has subsequently been referred to Thermopsis by Professor DE CANDOLLE and Mr. DAVID DON, and with a doubt to Baptisia by Professor HOOKER,

in whose Exotic Flora, tab. 131, there is an excellent figure and description. Notwithstanding these authorities, I must confess that it appears to me to be a genuine species of Anagyris, with which genus it agrees in the concretion of its stipulæ, in the inequality of its petals, and as far as I can judge from the inspection of half ripe pods, in its fruit also. The plant has indeed so entirely the habit of Anagyris fœtida that it seems to me highly inexpedient to separate them generically. Removing the species from Thermopsis will also relieve that genus, which consists otherwise of herbaceous plants only, of a plant which is extremely different from the rest in habit.

It is a native of the northern districts of Nepal, whence seeds seem to have been sent to England by Dr. Wallich so long since as the year 1820. In our Gardens it forms a tall bush, with handsome, ternate, dark green leaves, very dark green branches, and large yellow flowers, which are produced in great profusion from April to September. The plant is perfectly hardy, and a good addition to our shrubberies, in which it has long been hoped in vain that Anagyris fœtida might be established.

LIII. Rubus parvifolius. *Linnæus.*

R. foliis ternatis quinatisque subtus tomentosis, caule pedunculis petiolisque aculeis recurvis. *Ker in Botan. Regist. fol.* 496.

The fine season of 1825 caused this ornamental little plant which was introduced by the Society from China so long ago as 1818, to bear fruit in abundance, a circumstance that has not been known to have occurred in Europe before. The fruit was small, of a clear and brilliant pink colour, very juicy,

with a sub-acid, extremely pleasant flavour. The grains were few, large, and pointed. When in fruit it was one of the most beautiful plants in the Garden; it is however rather tender; the plant which bore fruit in the Arboretum was so much injured by the winter of 1825 and 6, that it died soon after the commencement of the succeeding spring. There is a good figure of this plant in a flowering state in the Botanical Register, fol. 496.

It would probably succeed well upon rock work, in which situation it may be expected to become capable of enduring our coldest winters: from its extraordinary merit when in fruit it well deserves careful cultivation. The flowers appear in July, and the fruit in August.

LIV. Podanthus Mitigui.

P. foliis rhombeo-ovatis dentatis glandulosis, capitulis solitariis pedunculatis.

Seeds of this plant were received from Mr. PLACE in 1823. It has also been sent to the Society at other times, and always under the name of *Mitigui*, by which it is known in Chili, of which country it is a native.

It forms a branched compact bush, about 3 feet in height. The leaves are opposite, stalked, rough to the touch, and covered beneath with a little down, and minute glandular dots, of a rhomboid-ovate figure, tapering to the point, and decurrent on the petiole; they are either entire, or, which is more usually the case, toothletted irregularly, of a dull, deep olive green on their upper surface, but much paler below. Heads of flowers hemispherical, solitary, seated on slender downy peduncles. Involucrum spreading, very downy, with about eleven leaflets, which are unequal both in length

and breadth, and scarcely imbricated. Receptacle hemispherical, paleaceous, the paleæ cuneate, membranous, slightly dotted toward the apex, as long as the florets, to which they closely adhere. Florets all tubular and hermaphrodite, dull greenish yellow, with an inflated throat, which is downy externally, and a smooth tube tapering down to the ovarium. Anthers 5, cohering, smooth, with rounded brown apices. Ovarium obovate, slightly downy, with a few long glandular hairs about the top. Pappus none. Style filiform, erect, seated on a long obovate discus. Stigma fusiform, two-lobed, hispid externally.

Notwithstanding the want of beauty in this plant, it is eminently deserving of notice on account of its botanical characters. In so great a degree has it the habit of Euxenia grata of Chamisso, that it would at first sight be taken for a nearly allied species. It differs however essentially both from that genus, and from Ogiera, in having united antheræ. M. La Gasca assures me that it is a genuine species of Podanthus, a genus founded by himself upon a shrubby Chilian plant with a similar habit, which has not yet been seen in England, but which differs in having pedicellate florets, and grains with an obscurely denticulated pappus, and also in foliage and inflorescence.

Nearly hardy, having survived the winter of 1825-6 in an open border, where it forms a small inconspicuous bush. Its branches are destroyed in very severe weather, but fresh shoots spring forth upon the return of summer. Flowers from August till November. Mr. Mc Rae gathered specimens in flower in the neighbourhood of Valparaiso in February 1825.

HERBACEOUS PLANTS.

LV. Astragalus chlorostachys.

A. caule erecto pubescente, stipulis liberis, foliolis 11-12-jugis oblongis pubescentibus, racemis pedunculatis multifloris foliis longioribus, leguminibus subarcuatis inflatis glabris.

A diffuse, bushy, caulescent perennial, from two to three feet high; perfectly hardy, and when in pod rather a handsome species. It is a native of Nepal, whence the seeds from which it was raised were received through the Honourable Court of Directors of the East India Company in 1823. Flowers from September to the end of October, and produces seed in abundance.

Stems round, pink, downy. Leaves very numerous, downy, of about 12 pair, those towards the point smallest; leaflets linear, oblong, obtuse. Stipules separate from the petiole, and from each other, ovate, acuminate, entire, reflexed. Racemes straight, axillary, stalked, appearing towards the end of the shoots, longer than the leaves. Stalk slightly angular, and like the calyces covered over with fine scattered black hairs. Calyx tinged with purple. Flowers greenish yellow. Pods stalked, somewhat falcate, inflated, 3 or 4 seeded; when nearly ripe much stained with red.

LVI. Eccremocarpus scaber. *Ruiz and Pavon.*

This extremely graceful creeper was raised from Chilian seeds presented to the Society in 1825 by FRANCIS PLACE, Esq. It is a half hardy suffruticose perennial, climbing over branches, sticks, or any thing similar near which it may

chance to grow, and in fine seasons rendering them brilliant with its panicles of glowing scarlet blossoms.

The foliage is finely cut, and resembles that of the Bignonia radicans in miniature, to the flowers of which plant its own blossoms bear much resemblance. A figure, and description will be found in the Botanical Register, fol. 939.

Propagated by seeds, which are produced in tolerable abundance, but which sometimes do not vegetate till the second season after they are sown, and also by cuttings of the year-old wood. It should be raised in all respects like French Marigolds, and flowers of that description.

LVII. Mikania scandens. *Willdenow.*

M. caule scandente glabro, foliis cordatis repando-dentatis acuminatis: lobis divaricatis inæqualibus, floribus corymbosis. *Willd. sp. pl.* 3, *p.* 1743.

Eupatorium scandens. Linnæus.

This plant climbs to the height of about 6 feet, and has the habit of some kind of Convolvulus. The leaves are cordate sagittate, quite smooth and membranous. The flowers grow in bunches from the axillæ of the leaves, are of a delicate pink colour, and are produced in the greatest profusion.

A very neat pretty perennial, flowering in September. From its near relation to the famous M. Guaco which is very like it, it may be presumed to possess some of the medicinal properties of that species. The plant that flowered in the Garden was brought from North America in 1824, by Mr. Douglas. It grew freely in a peat border exposed to the North.

LVIII. Lespedeza capitata. *Michaux.*

L. erecta simplex, petiolis brevissimis, foliolis ellipticis subtus adpresso-pubescentibus, spicis capitatis brevè pedunculatis axillaribus et conglobato-terminalibus, calycibus villosis longitudine corollæ legumine multo longioribus. *Dec. prodr.* 2. 349.

An herbaceous plant about 2 feet high, with a nearly simple erect stem, all covered with silvery leaves. The flowers appear in September, in heads in the axillæ of the leaves, and are of a pale yellow or straw colour. The neatness of its appearance renders it a desirable border plant.

Brought from N. America by Mr. DOUGLAS in 1824. A peat border is the proper place for the cultivation of this species.

LIX. Althæa nudiflora.

A. foliis cordato-rotundis 5-angulatis trilobisve crenatis scabro-pilosis, caule petiolis pedunculisque hispidis, racemo ebracteato nudo, floribus geminis, petalis cuneatis emarginatis.

A biennial, with a stem six feet high, and the habit of the Common Hollyhock. Leaves large, roundish-cordate, 5-angular or 3-lobed, crenate, a little shining, harshly hairy on both sides. Leafstalks and stems hispid, stimulant. Stem slender, erect, 4 feet high, round, hispid, with fascicles of stiff fragile hairs. Stipules half-ovate, cut, deciduous, with a broad base. Flowers large, white, stalked, growing in pairs, naked, (without bracteal leaves). Flower-stalks hispid, with short fascicled hairs. Involucre 6-7-fid, campanulate, half as long as the calyx. Calyx 5-lobed; lobes ovate, blunt, 5-nerved. Petals white, with a greenish yellow base, cuneate, emarginate, their claws with villous edges.

This plant is remarkable for its hispidity, which is caused by an infinite number of fascicled stiff brittle hairs, and for the

want of leaves or bracteæ under the flowers. It differs from A. pallida in these particulars and in its leaves not being soft but extremely harsh to the touch.

Raised from seeds from the Altai Mountains, presented to the Society by Dr. Fischer, in 1824. Quite hardy, and flowers abundantly in July and August.

LX. Nolana tenella.

N. viscido-pilosa, caule filiformi, petiolis ciliatis, foliis ovatis utrinque obtusis, calyce bilobo 5-angulari campanulato, ovario 5-lobo.

Presented to the Society, in 1824, by Robert Barclay, Esq. by whom it was raised from Chilian seeds. Flowers in August. This very pretty species has been confounded in the Botanical Magazine, tab. 2604 with my Nolana paradoxa, an extremely curious and widely different plant.

The whole plant is covered with viscid hairs. Stem filiform, pale green. Leaves membranous and very tender, stalked, ovate, obtuse at each end, and frequently somewhat unequal at the base; the petioles about half as long as the leaves, and fringed with long hairs. Flowers solitary, axillary, erect, longer than the leaves. Peduncles filiform, hairy. Calyx 2-lobed, 5-angled, campanulate, hairy, one of the lobes being emarginate the other 3-toothed. Corolla very like that of a Convolvulus, pale blue, with a whiter eye, lined with cæru-lean; limb 5-angled, a little recurved; stamens unequal, shorter than the corolla. Filaments villous. Pollen blue, oval. Ovary 5-lobed. Style one. Stigma obsoletely capitate, slightly compressed.

Although less handsome than N. paradoxa, this is a far more delicate and interesting species than the common N. prostrata. It is an half hardy annual.

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Astragalus chlorostachys	LV.
Baptisia? Nepalensis. Hooker.	LII.
Caprifolium Douglasii	LI.
Eccremocarpus scaber. *Ruiz and Pavon.*	LVI.
Eupatorium scandens. Linnæus	LVII.
Lespedeza capitata. *Mich.*	LVIII.
Mikania scandens. *Willd.*	LVII.
Nolana tenella	LX.
Podanthus Mitigui	LIV.
Prunus salicina	XLVI.
—— serrulata	XLV.
Pyrus arbutifolia	XXXVII.
—— β intermedia	XXXVII.
—— γ serotina	XXXVII.
—— Aria. *Ehrhart.*	XLIII.
—— —— *acuminata.* Hort.	XLIII.
—— —— acutifolia. *Dec.*	XLIII.
—— —— angustifolia	XLIII.
—— —— bullata	XLIII.
—— —— Cretica. *Hort.*	XLIII.
—— —— *Græca.* Hort.	XLIII.
—— —— obtusifolia. *Dec.*	XLIII.
—— —— *ovalis.* Hort.	XLIII.
Pyrus Aria *rotundifolia.* Hort.	XLIII.
—— —— rugosa	XLIII.
—— —— undulata	XLIII.
—— depressa	XXXIX.
—— floribunda. *Lindley*	XXXVIIII.
—— grandifolia	XLII.
—— melanocarpa	XL.
—— β subpubescens	XL
—— pubens	XLI.
Rosa Alpina; *var.* speciosa	XXXVI.
Rosa Banksiæ; *var.* flava	XXXV.
—— Dicksoni	XXXIV.
Ribes alpinum; *var.* pumilum	L.
—— aureum. *Pursh.*	XLVII.
—— —— *a* præcox	XLVII.
—— —— β serotinum	XLVII.
—— —— γ sanguineum	XLVII.
—— *flavum.* Colla	XLVII.
—— setosum	XLIX.
—— tenuiflorum	XLVIII.
Rubus parvifolius. *Lin.*	LIII.
Thermopsis laburnifolia. D. Don.	LII.
—— *Nepalensis.* Decandolle,	LII.
Virgilia sericea. Hort.	LII.
Ulex europæus; double variety,	XLIV.

XXVIII. *Suggestions respecting the Culture of the Mango and Cherimoyer.* *By* THOMAS ANDREW KNIGHT, *Esq. F.R.S. &c. President.*

Read June 19, 1827.

SOME years ago I attempted to cultivate the Mango; and I took all possible care that a proper temperature should be preserved in the stove, that air should be freely given, and the plants properly supplied with food and water. My efforts however proved wholly abortive. Blossoms were produced in considerable abundance; but at the period when these appeared, many strong luxuriant shoots began to spring from the stems and the bases of the larger branches of my plants, the extremities of which then languished, and the blossoms fell off; and I found it not very easy to preserve my trees alive.

In the Gardens of the Earl of POWIS, in the last autumn, I saw small trees of this species loaded with as heavy crops of most excellent fruit, as Apple trees of the same age and size could well have borne, and exhibiting as luxuriant a state of health as trees of that species usually shew, when growing in a favourable soil and climate. The management of the trees in the Gardens of the Earl of POWIS was unquestionably very good; but there did not appear to me much peculiarity in it, either in the application of heat or moisture, and I do not consider the state of his Lordship's stoves to have been in some respects nearly so favourable as those in which my

unsuccessful experiments had been conducted. They were very high, and the tops of the small trees consequently stood at a considerable distance from the glass; and these circumstances, I believe, are always considered by Gardeners to be disadvantageous. In one respect only the management of the Mango trees in the stoves of the Earl of Powis differed essentially from mine: the pots, in which my plants grew, were on every side fully exposed to the air, whilst his Lordship's were plunged into a bark-bed, into which the appearance of the plants left no doubt upon my mind of their having rooted deeply. The temperature of the bark-bed appeared to me to be very low, and judging from that of its surface, the moderate size of the bed, and the distant period at which it had been made, I doubted whether it continued to generate any degree whatever of internal heat. But whether the bed did, or did not, continue to generate heat, I did not, nor do I now, consider the success of the mode of culture to have resulted in any degree from the temperature of the material in which the roots of the plants grew; for the temperature of the mould in which my plants grew was, I conceive, as favourable as possible. That of the air was varied in my stove generally from about 70° to 85° of Fahrenheit's scale; and I ascertained, by keeping a thermometer immersed in the mould of the pots, that the temperature of that varied very considerably less than that of the air of the stove, the mould being in the morning generally some degrees warmer than the air of the house, and in the middle of the day and early part of the evening, some degrees cooler.

I have subsequently attempted to cultivate the Cherimoyer

during the years 1825 and 1826, in the stove, and I have observed similar derangements of the proper growth of the plants, similar protrusion of buds upon different parts of the stems, and, apparently, consequent failure of the blossoms. The cause of these circumstances I was wholly at a loss to conjecture till the spring of the present year, when I had the honor to receive from an eminent French naturalist, M. Dutrochet,* a publication which afforded me much new and important information respecting the causes of the motion of the fluids, and of the various secretions of plants: and the facts he adduced led me confidently to believe that the ill success of both my experiments had arisen from an excessive or injurious action of electric matter upon the roots of my plants, owing to the exposure of the surfaces of the pots to the air. A pot containing a plant of the Cherimoyer, which was by no means in a healthy state, was in consequence immediately plunged to its top in mould, which was kept in a moist state, and pressed closely round it. The effects of this were precisely such as I had anticipated: the buds ceased to spring from the stem and larger branches of the plant, whilst the extremities of it began to elongate, and in six weeks it acquired a perfectly healthy appearance, which it still retains. The buds of this species of fruit tree being wholly concealed from view beneath the centre of the base of the leaf-stalks, it is wholly impossible to decide at this period whether blossom-buds are forming for

* Of Chateau-Renaud, a Foreign Corresponding Member of this Society. The object of his work, to which I wish to refer the Society, is to point out "L'agent immediat du mouvement vital devoilé dans sa nature, et dans son mode d'action chez les végétaux et chez les animaux."

the next spring, but I entertain very little doubt that such will be then seen in great profusion, and I look forward with strong hopes to a crop of fruit. Should these hopes be realized, it will not, I conceive, be improbable, that many other fruit-bearing trees, which now produce flowers only in our stoves, may be made to afford fruit by attention to the forego ing circumstances.

I have not at present an opportunity of subjecting a Mango tree to the above described mode of treatment; but I feel confident that it would be successful, and I scarcely entertain a doubt respecting the source whence the trees of the Earl of POWIS derived their luxuriant health, and capability of affording their abundant and excellent produce. Possibly the health of many plants of difficult culture might be preserved by placing their pots within larger pots, and filling the intervals with earth. Those species of Heath, which are frequently seen to die suddenly without apparent cause, appear to be very proper subjects for such an experiment.

Whenever I have adopted the practice of plunging the pots into the ground, or into the soil of a larger pit, I have almost invariably used pots without any apertures, to prevent the escape of water, and of the roots. Gardeners are generally very strongly prejudiced against pots of this construction; but whenever plants are kept constantly under glass, I have found that they may be used with advantage; and by properly covering the mould with tiles, I have not found any difficulty in preventing, during summer, the ingress of too much water, when the pots have been placed in the open air.

Plants of every species are, I think, more or less affected, but not all injuriously, by having the sides of their pots exposed fully to the air. The taste and flavour of the Peach and Nectarine, and still more of the Strawberry, are greatly improved; and the Fig tree, in the stove, is made to afford a longer succession of produce, owing to the succession of young shoots, which are caused to spring from its larger branches and stems; and in all cases when trees can be made to retain their health in exposed pots, the period of the maturity of their fruit is very considerably accelerated.

The Malcarle, or Charles Apple

XXIX. *Some account of the Mela Carla, Malcarle, or Charles Apple. By* John Lindley, *Esq. F. R. S. &c. Assistant Secretary.*

Read February 19, 1828.

In the Pomona Italiana of Gallesio* is figured and described an Apple, of such merit, that in the opinion of the author, it excels every other variety of that fruit. He states that it is a native of the territory of Finale in Liguria, where it was raised from seed, on which account it is called the Finale Apple, as well as the Mela Carla; that it ripens in September, keeps well till the following spring, and will remain fresh till the succeeding autumn; that in October it is a pale yellowish green, covered with bright red on one side, and has a breaking sweet high flavoured flesh; that in November it acquires a slight perfume of Pine Apple, and its flesh becomes more tender; and that finally its red colour fades a little, its green changes to a clear waxy yellow, its perfume diminishes, and its flesh becomes extremely delicate without losing any part of its flavour; in short that it has no equal in beauty, tenderness of flesh, delicacy of flavour or fragrance. He also adds that its extraordinary qualities, render it an important article of trade in the whole of the Genoese territory, and of exportation to Nice, Marseilles, Barcelona, and Cadiz.

* Vol. I. Plate and Page 1. For a copy of this work, the Society is indebted to the munificence of the Marquess of Bristol.

A character of such a kind could not fail to excite much curiosity, and a strong desire to procure the variety. Trees were accordingly obtained from various quarters, by the Society, and planted in the orchard of the garden at Chiswick. Some of these have borne fruit, and have been found to resemble the description of GALLESIO in nothing except figure and delicacy of flesh; being destitute of colour, fragrance and flavour. This having been found to agree very nearly with specimens ripened in Ireland, by Mr. ROBERTSON of Kilkenny, and communicated to the Society in October 1824, it appeared, either that the Italian account was extremely exaggerated, or that the climate of Great Britain was unfavourable to maturing the fruit.

The first of these two points has been determined in the course of the present winter, from specimens ripened in Italy and sent to the Society from Turin, by the Right Honourable AUGUSTUS JOHN FOSTER, His Majesty's Envoy Extraordinary, and Minister Plenipotentiary at the Court of Sardinia. By these, the description of GALLESIO was so perfectly confirmed in every material circumstance, that it has been considered proper to prepare the present statement, and to illustrate it by a coloured figure of the fruit in the state in which it was received from Italy.

In form, the specimens from Mr. FOSTER, were nearly round, a little inclining to ovate, with a very regular outline, about the size of a Golden Reinette; the eye was small and destitute of angles, the stalk long, slender, nearly smooth, and inserted in a small deep cavity. The skin was of a delicate waxen texture, with no spots, except a very faint mottling of green appearing through the skin near the eye,

pale clear yellow on the shaded side, and brilliant crimson next the sun, the two colours scarcely melting into each other, but separating rather abruptly. The flesh was white, tender, remarkably delicate, sweet, with a delicate perfume like that of roses, which was sensibly perceived before the fruit was cut.

With regard to the fitness of the Mela Carla for this climate, it must be observed that all the specimens which have been seen by the Society, have been ripened on open dwarf or standard trees, and those in the Garden at Chiswick under circumstances by no means favourable otherwise. If the trees were trained upon a wall with a southern aspect, there would be every reason to hope for a successful result; they being perfectly robust, and bearing readily. The experiment at least deserves a trial, as the fruit if obtained would be an acquisition to the dessert. Upon the subject of climate, it is remarked by M. GALLESIO, that it must be very mild, and not too near the sea, for even in Finale, the fruit is only in perfection in vallies in the interior. That produced on the opposite slopes of the Appennines towards Piedmont, is much less excellent. The soil too should be neither too dry nor too moist, the fragrance and flavour of the fruit, being in either case sensibly impaired.

It is further remarked by LIPPOLD,* by whom it is called the Malcarle Apple, that in the Rhine districts, it does not acquire its fragrance on account of the unfavourable nature of the climate.

The name of Mela Carla, Malcarle, or Charles Apple,

* Taschenbuch des Verstandigen Gärtners, 1824, p. 141.

appears to have been applied to it in compliment to King Charles the third of Spain, to whom trees were sent by Count PRASCA of Finale, many years ago. Nothing is known of their success in Spain, but they possibly still exist in the orchards of Aranjuez, where they were originally planted.

XXX. *A Review of the Fifty kinds of Grapes described by Mr.* SPEECHLY *in his "Treatise on the Vine," with such Corrections as subsequent experience shews the necessity of.*

By Mr. JOSEPH THOMPSON, *Corresponding Member of the Horticultural Society, Gardener to his Grace the Duke of* PORTLAND, *at Welbeck, in Nottinghamshire, and Successor to Mr.* SPEECHLY.

Read February 5, 1828.

IN consequence of having had frequent opportunities, as gardener at this place, of becoming acquainted with the Vines mentioned by Mr. SPEECHLY in his work upon the Varieties of that fruit, I have drawn up the following remarks, which I beg permission to lay before the Society. In acquiring the means of doing this, I have been much aided by memoranda made in 1785 and 1786, by myself, and the late Mr. THOMAS HUNT, formerly gardener at Bulstrode, who was at that time my fellow workman, and student at Welbeck. Our zealous endeavours for improvement were only exceeded by the frank and candid conduct of our worthy master, who made us acquainted with his notes and observations. He had been upwards of seven years collecting Grapes, and writing his Treatise on the Vine, the manuscript copy of which was at that time in a forward state, except the descriptive list and some notes.

There were cogent reasons why Mr. SPEECHLY could not occupy his principal places and rafters with unknown kinds

of Vines, the garden at Welbeck not being an experimental garden; and although he had the advantage of a large and lofty Pine stove, yet he was confined to pots and grafts in fruiting all the new kinds which he and his friends had imported; he often regretted that he had not better means to ascertain the true character of those kinds he was not well acquainted with. His list at that time contained one hundred and twelve names; but he entertained great doubts whether he should be able to make out fifty distinct kinds. From those causes his descriptive list did not become a perfect standard, which disappointed many gentlemen who consulted it in the formation of their collections, and caused vexatious disputes to nurserymen and gardeners. I hope this Paper will go one step towards remedying the defects of Mr. SPEECHLY's list.

No. I. *White Muscat of Alexandria.*

This good and well known Grape does not stand in need of any comments, it is sometimes called the White Tokay in the Northern Counties.

No. II. *Black Damascus.*

Is well described by Mr. SPEECHLY, and is pretty well known and much approved of by most gentlemen; but it is so shy and uncertain in its produce that it seldom bears any thing like a full crop in the most favourable situations where all the other Vines in the same hot-house are sufficiently loaded with fruit. Its foliage is also so tender that it is subject to be scorched at a temperature which most other Vines will endure. Those circumstances make it no favourite with practical gardeners. What renders this Grape so universally

approved of, is the small quantity of fibrous substance, and the abundance of very rich vinous juice contained in the berries. These good qualities render it liable to internal decomposition very soon after maturity. It stands under two different names in the nurserymen's catalogues, viz. Black Damascus, and the Worksop Manor Grape; the latter name originated with the late Mr. NORTH, Nurseryman. It was imported from Damascus by EDWARD, the ninth Duke of NORFOLK, and first cultivated at Worksop Manor many years prior to that nobleman's decease. In the years 1786 there was a Vine of this kind in the present Manor Gardens, which covered the end, and three rafters of a Pine stove. Mr. COOPER, the gardener, had raised this from the original imported tree which grew in the old garden.

No. III. *Black Grape from Tripoli.*

This good Grape stands very erroneously described by Mr. SPEECHLY, who had, previous to the publication of his book in 1789, only grown it in a pot, and grafted on a spur of the Syrian Grape. He says "this Grape seems nearly allied to the former species, but the branches are always composed of large equal sized berries with one stone in each, &c." Subsequent cultivation proves that its general character bears no affinity to the Black Damascus. This kind grows freely without stoppages, and is very prolific. The leaves are strong and succulent, not liable to scorch by any moderate temperature, they are more lobed, and on long foot stalks. The bunches are well shouldered, with long slender peduncles. The berries are nearly all of a size, and are undulated slightly. Some are without seeds, and some have two or three

of them in each berry, but they are remarkably small compared with any other kind. The berries are not near so black, and never possess that fine rich bloom which the Black Damascus does. It also comes to maturity nearly a month earlier in the same temperature. Its berries are tender and rich, but they contain sufficient fibrous substance to prevent internal decomposition for from two to four weeks after maturity in a moderate temperature. Mr. SPEECHLY planted two of this kind as principals which were strong Vines previous to 1801; since then the number has been increased; and I presume that no gentleman will be disappointed if he plants one of this kind even in a small collection.

No. IV. *Aleppo Grape.*

The prolific produce and curious striped berries of this Grape are the strongest recommendations it has. The berries are small and their skins so delicate, that the humidity which accumulates on the rough footstalks brings on decomposition round the indented part of the berry, almost before it arrives at maturity.

No. V. *Red Grape from Syracuse.*

There was one principal Vine of this kind planted by Mr. SPEECHLY, whose description of it is quite accurate as far as it goes, but he says nothing as to the quality of the fruit, which is not very good; the berries are remarkably firm, and when quite ripe, it has a dry roughish sloe-like flavour. The best qualities of this Grape are its strong growth and abundant produce; the hard flesh and thick skin of the berries cause it to resist the humidity of a Pine stove longer than any other except the Cornichon Grape, No. L.

No. VI. *Le Cœur Grape, or Morocco Grape.*

This is quite a fancy Grape, and its few merits are made almost too much of by Mr. SPEECHLY. One plant in a large collection will be found quite enough. It is slow and stunted in its growth, and very shy in its produce, bearing a sickly appearance at almost all seasons. The bunches are short, with small stiff shoulders. It is a late Grape, and the small berries are generally ripe and decayed before the large ones; so that before it gets to the table the bunches have a scraggy disagreeable appearance, and but few berries on them. The flavour is rich and musky; it is very unfit for package or carriage, by reason of its short rigid footstalks. There was one Vine of this kind planted as a principal by Mr. SPEECHLY, which was justly expelled many years since. The Grizzly Frontignac is by far preferable.

No. VII. *Golden Galician.*

I never saw this Grape since 1786, when it was in fruit in a pot; it was only grown in pots at this place, and was put out of the collection long before 1801.

No. VIII. *Black Muscadel.*

Stands well described by Mr. SPEECHLY, and is a tolerably good Grape. It forms a handsome contrast engrafted on the White Muscat of Alexandria, their habits of growth, &c. are in unison. The small berries ripen before the large ones. It has been put out of this collection some years. It is now cultivated in some places under the name of the Mogul Grape; by Mr. SPEECHLY it was cultivated under both names.

No. IX. *Red Muscadel.*

Of this kind Mr. SPEECHLY had one principal Vine. I neversaw the bunches so large as he has stated. The flavour is a little better than that of the Red Syracuse, and the skin is a little thinner. The rudiments of the style adhere to the oval ends of the berries, and leave a rough spot which retains humidity, whereby decomposition takes place sooner in this Grape than in the Red Syracuse, No. V.

No. X. *White Grape from Alcobaca.*

This was cultivated in pots, and the White Lombardy by the side of it; they were both alike, and both put out of this collection some time before 1801.

No. XI. *White Frontignac.*

This is a good and well known Grape.

No. XII. *Grizzly Frontignac.*

Is also well known.

No. XIII. *Black or Purple Frontignac.*

This is the best and most prolific Grape that I know; it must be kept very long after maturity before it becomes black, and then its exquisitely rich flavour is gone; the skin of the berries becomes tough, and the juice vapid. Mr. SPEECHLY always called this Grape the Purple Constantia, both before and after the publication of his Vine-book. He obtained it and the White Constantia from the Cape of Good Hope; and although he notices the White Constantia at page 134, yet he always said that it was no other than the

Old White Frontignac, to which the Purple Constantia is nearly allied except in colour.

No. XIV. *Blue, or Violet Frontignac.*

This is the true Old Frontignac. No Grape will stand early forcing better; its leaves are small and firm, and not liable to scorch; it is very prolific, but the bunches are small, with short stiff peduncles, for which reason it is not a good kind for packing or carriage, the berries breaking off easily. It has recently been imported from France by a gentleman who sent me a plant under the name of Noir Précoce.

No. XV. *Red Frontignac.*

Is very much like the Grizzly Frontignac; its colour is a little darker, and I never saw the bunches so large and well shouldered as the latter kind, which is the better Grape of the two.

No. XVI. *White Sweetwater.*

Well known as a good standing kind. The variety described by Mr. SPEECHLY was the old Dutch kind, which he obtained when in Holland. The variety called Stillward's Sweetwater is now cultivated here, as being larger in the bunches and berries also, the latter of which are of a more delicate dead white, with transparent veins. The liability of the tender foliage to be scorched, and the berries to crack in a moderately high and humid temperature, renders this Grape rather improper for a Pine stove.

No. XVII. *Black Sweetwater.*

Both bunches and berries of this kind are smaller than the White Sweetwater; and, as Mr. SPEECHLY justly observes,

it is quite an improper kind for the Pine stove. The berries are very subject to crack even in a late Vinery.

No. XVIII. *Black Hamburgh, or Warner's Grape.*

Is so well known that it needs no further description.

No. XIX. *Red Hamburgh, or Gibraltar Grape.*

Better known to most old gardeners under the name of Black Gibraltar Grape. It is very different from the Black Hamburgh; its bunches and berries are not so large; the berries are quite globular and almost indented at the end, with a tender delicate skin, and without the rich bloom of most other Grapes; so that they have a purplish transparent appearance, shewing the veins and fibres, like Stillward's Sweetwater.

No. XX. *White Hamburgh, or Portugal Grape.*

This Grape was never cultivated at Welbeck except in a pot, and grafted on the Syrian, to which it is so nearly allied, that a distinction is hardly possible. Its cultivation had been discontinued previous to 1801.

No. XXI. *Malvoisie, or Blue Tokay.*

Is well described by Mr. Speechly. It is a very free-bearing kind, the bunches are about the size of the Black Cluster, and equally full of stones. It is not a good Grape to keep after maturity.

No. XXII. *Genuine Tokay.*

Is really a good Grape; its bunches are much larger than the Blue Tokay, it is an abundant bearer, and of a very rich flavour: its short rigid footstalks and delicate skin render it

a bad Grape for packing and conveyance, which is the only fault it has.

No. XXIII. *Lombardy, or Flame-coloured Tokay.*

This is well described by Mr. SPEECHLY; it generally bears the name of Red Rhenish, or Flame-coloured Tokay; it is a fine-looking handsome Grape, the bunches generally terminate abruptly, and the berries are firm and of very inferior flavour compared with the other Tokay kinds.

No. XXIV. *Smyrna Grape.*

This kind was only cultivated in a pot, and was put out of the collection soon after 1790.

No. XXV. *Brick Grape.*

Was discarded long before 1801. It never had a place in the Welbeck collection except in a pot.

No. XXVI. *Black Spanish, or Alicant.*

This good Grape is well described; it bears many names, in different collections, viz. Black Valentia, Black Portugal, Black Lisbon, Black Prince, &c. It is not at all like the Old Black Lombardy, now called West's St. Peter.

No. XXVII. *White Muscadine, or Chasselas.*

Is a well known good old standing Grape. Mr. SPEECHLY has marked this as a Pine stove Grape, but according to the present practice in Pine stoves, it will be found much too tender in its foliage for early forcing,

No. XXVIII: *Black Muscadine.*

Is well known. The kind Mr. SPEECHLY mentioned under

the name of Frankindale, as grafted on the Red Muscadel: it was certainly a distinct variety; its produce was not equal to the Black Muscadine; its branches were longer and not so much shouldered, and its flavour was rough, austere, and sloe-like, even when well ripened.

No. XXIX. *Royal Muscadine, or D'Arboyce.*

The name of Royal Muscadine to this Grape was continued from MILLER's Dictionary. Mr. SPEECHLY generally called it the small White Portugal. It is not so good flavoured as the White Muscadine. It was cultivated here only in a pot and on grafts.

No. XXX. *Malmsey Muscadine.*

I never could distinguish any difference between this and the preceding kind but what arose from its stunted growth in a pot.

No. XXXI. *Claret Grape.*

Cannot be better described than it is.

No. XXXII. *Syrian Grape.*

Is well known and well described. For a late Grape no moderate collection should be without it.

No. XXXIII. *Miller's Burgundy, or Meunier Grape.*

No. XXXIV. *Small Black Cluster, or Auvernat.*

No. XXXV. *Large Black Cluster.*

Are very common and well known.

No. XXXVI. *White Morillon.*

Is genuine Tokay. See No. XXII.

No. XXXVII. *Early Black July Grape, or Morillon noir hâtif.*

I never saw in a stove or Vinery.

No. XXXVIII. *Cat's Grape.*

This I never saw but in a pot, and a more worthless Grape cannot be imagined.

No. XXXIX. *Black Raisin Grape.*

Is Black Muscadel. See No. VIII.

No. XL. *White Raisin.*

Is White Hamburgh. See No. XX.

No. XLI. *Damson Grape.*

This kind is not well described so far as regards its fruit, which has shortish stiff footstalks, with short stiff shoulders; the succulent character of its leaves is very remarkable. This Grape even when well ripened, has an austere medlar-like flavour, which to some palates may be agreeable.

No. XLII. *Early White Grape from Teneriffe.*

Is White Muscadine. See No. XXVII.

No. XLIII. *St. Peter's Grape.*

This is well described. I have seen bunches of this kind sixteen inches long, and almost always with shoulders. Its constant fault of the berries cracking more than any other

Grape, makes it unworthy of a place in a stove or Vinery even in a largish collection.

No. XLIV. *Black Grape from Palestine.*

Is the same as the St. Peters, No. XLIII.

No. XLV. *White Parsley-leaved Grape, or Ciotat.*

Is as described.

No. XLVI. *Black Lisbon.*

Is Black Spanish. See No. XXVI.

No. XLVII. *Greek Grape.*

This is well described; it is a prolific good Grape, but the want of fibrous substance in its berries makes it not keep many days after maturity. It is grown in the counties of Durham and Northumberland under the name of Green Chee.

No. XLVIII. *White Corinth Grape.*

Is well described. I only have to add, that the want of pulpy substance in the berries renders it subject to decomposition immediately after maturity, like the Greek Grape.

No. XLIX. *White Muscat of Lunel.*

I am sorry that I never saw this Grape in fruit, it was only cultivated in a pot.

No. L. *Cornichon.*

This remarkably formed Grape is a very worthless kind, it must be well ripened to be at all eatable; the best recommendation it has is its long keeping.

XXXI. *An Account of the Species of* Calochortus; *a Genus of American Plants. By Mr.* David Douglas, *A. L. S.*

Read February 19, 1828.

We derive our knowledge of this hitherto little known Genus of Plants from Pursh, who describes it in his *Flora Americæ Septentrionalis*, vol. i. p. 240, from a solitary specimen found by Lewis and Clarke in their expedition across the continent, during the years 1804, 5, and 6, in the recesses of the rocky mountains, and west of them, towards the waters of the Pacific Ocean. For a more copious account of it, the same author refers to his communication made to the Linnean Society, and quotes volume xi. of the Transactions; but it seems the Paper referred to, never was printed. As, in the course of my late journey through the districts adjoining the River Columbia, I was fortunate enough to find the species already described by Pursh, and two others, not before observed, I am enabled to give some additional information respecting this interesting and highly ornamental Genus.

The species of Calochortus are bulbous rooted plants, with striated stems, narrow sheathing leaves, and beautiful purple, or white flowers, remarkably bearded in the inside. The original species of Pursh, C. elegans, is so different from the two others now about to be described, that, without a careful analysis of the parts of fructification, it might be supposed that they belong to distinct genera. That this however is

not the case, will I hope be apparent from a comparison of my descriptions, and the drawings that accompany them.

The Genus to which Calochortus is most nearly related, is Fritillaria, with which it agrees in the obtuse, reflected, 3-lobed stigma; the structure of the capsule; the horizontal flat-seeds, and having a solid bulb. It differs from it in the imbricated distinct petals, in which respect it resembles Lilium, in their filamentose appendages, in the shortness of the stamens, and in the insertion of the seeds in a single row.

Calochortus.

Pursh Flora Americæ septentrionalis, vol. 1. *page* 240.

Gen. Char.—Petals 6, spreading, erect or drooping, lying over each other, the three inner larger, with a filamentose tuft above the claw. Filaments 6, short, inserted at the base of the claw; anthers oblong, quadrangular, half the length of the corolla. Ovarium superior, 3-angular; style very short; stigma 3-lobed, reflexed. Capsule variable in form, linear, or oval, 3-celled, many seeded, splitting at the apex into 3-valves, dehiscing through the dissepiments. Seeds numerous, horizontal, flat, oval, semicircular, or angular, in one row, with a membranous testa.

Char. Ess.—Petala 6, patentia: tribus interioribus majoribus supra unguem pilis pulvinatis. Capsula 3-angularis, 3-locularis, 3-valvis, septicidò dehiscens. Semina plana serie simplici inserta.

Species.

1. C. *macrocarpus;* caule 3-5-phyllo bifloro, petalis interioribus præter fasciculum pilorum glabris, capsulis erectis lineari-oblongis.

Root bulbous, solid. Stem round, erect, smooth, 3-or 5-leaved, eighteen inches to two feet high. Leaves linear,

B.1.

B.2.

B.

B.4.

B.5.

B.3.

A.

A.2.

A.4.

A.3.

B.

A. Calochortus nitidus

B. Calochortus elegans.

glaucous, smooth, shorter than the scape, convolute and strongly nerved. Bracteæ acuminate, longer than the peduncles, and membranously winged at the base. Flowers terminal, 2 with unequal peduncles; one double the length of the other, and thicker than the stem. Outer petals lanceolate, acuminate, one ribbed, often irregularly winged, partaking of the nature of a calyx, longer than the inner, which are obovate-wedge shaped, membranous, rich purple, with a transverse brown streak above the tuft of hairs, which are yellow. Anthers deep purple. Ovarium 3-celled, with the ovules arranged in a double row. Stigmas reddish. Capsule linear-oblong, acute. Seeds oval, pale yellow, in a single row.

In June 1825, during an excursion to the undulating, dry barren grounds around the Great Falls of the Columbia river, and on the summit of the low hills between them and the Grand Rapids, 200 miles from the ocean, this species came under my notice, but not commonly. In the summer of 1826, I again observed it, and in abundance, on the banks of the southern branches of the Columbia, towards their sources in the mountains, growing luxuriantly in similar soils.

2. C. *nitidus*: caule 2-3-phyllo quadrifloro, petalis interioribus præter pilorum fasciculum sparsè lanatis, capsulis erectis ovalibus.

Root bulbous, solid. Stem round, erect, smooth and glossy. Radical leaf long, linear, obtuse, convolute, and strongly nerved. Bracteæ acuminate, shorter than the peduncle. Peduncles unequal, two double the size of the others; the smaller two situated in the centre. Flowers terminal, invariably four. Outer petals lanceolate-acuminate, and like the preceding, ribbed and winged at the base. Inner petals obovate-wedge-shaped, covered with very long, loose, entangled,

scattered, white hairs. Filaments slender. Anthers white, oblong, and pointed. Stigma nearly sessile, yellow. Capsule elliptic, 3-angular. Seeds obliquely cuneate.

I found this in July and August 1825 in mountain vallies; it is seldom or ever seen on low grounds. On the chain of the Blue Mountains, and mountainous district of the Columbia, from the confluence of the Spokan River upwards, it is by no means rare. In beauty it rivals the former.

3. C. *elegans*: caule unifolio 3-5-floro, petalis interioribus præter pilorum fasciculum sparsè lanatis, floribus cernuis, capsulis reflexis ovalibus.

Root bulbous, solid, sub-globose. Stem simple, smooth, round, 2 to 8 inches high, with 3 to 5 flowers. Leaf longer than the scape, smooth, convolute, and nerved. Bracteæ ovate-acuminate, shorter than the pedicels, which are slender. Flowers drooping, white. Outer petals lanceolate; inner ovate, pilose, or hairy on the inner side; tuft of hairs black. Anthers white. Stigma deeply cleft. Segments linear, yellow. Capsule oval. Seeds .....

Found on the sub-alpine regions of the dividing ridge of the Continent at the same season as the others. It is a variable little plant; in the vallies four to eight inches high, and on the mountains, near the verge of perpetual snow, not exceeding one or two inches. I had no opportunity of seeing perfect seeds.

In the hope of future botanists visiting its country, it may not be improper to state, that a fourth species, a magnificent plant, may be gleaned on the dry grounds around the Priests Rapid on the Columbia and upwards, to the confluence of Oakenagen River. In spring it forms an article of food of

the inland Tribes, and is called in their tongue *Koo-e-oop*. Unfortunately, at the time I found it, it was beyond my power to preserve it, and I regret to say that the note taken was also lost. From recollection, it has a stem 9 to 15 inches high, terminating with 2-3 large blue flowers; and has one very long, linear, smooth, glaucous, white, leaf. The root is roundish, crisp, and juicy, yielding a palatable farina when boiled.

I also believe that the *Fritillaria barbata* of M. Kunth,* found by Messrs. Humboldt and Bonpland, on the mountains of Mexico, is a fifth species.

The drawing of the accompanying figure of Calochortus macrocarpus was taken from specimens produced in the Garden of the Horticultural Society at Chiswick, in August 1827; those of C. nitidus and C. elegans, have been made by Mr. Lindley from dried specimens in my collection. The latter have been added, in order that the account of this very rare genus may be rendered as perfect as possible under existing circumstances.

Explanation of the Plates.

Plate 8. *Calochortus macrocarpus.*

1. A stamen, much magnified. 2. The back of an anther. 3. A section of the ovarium. with a part of the peduncle. 4. The upper half of the ovarium and the stigmas. 5. A transverse section of the ovarium. 6. One of the stigmas opened. 7. A capsule. 8. A

* Synopsis plantarum æquinoctialium orbis novi. Vol. i. p. 292.

seed the natural size. 9. The same magnified. 10. A portion of the testa much magnified. 11. The nucleus shewing the chalaza. 12. The embryo. 13. A longitudinal section of the same, shewing the plumule and radicle.

Plate 9. A. *Calochortus nitidus.*

1. A petal, shewing the beard. 2. A ripe capsule. 3. Seeds, the natural size. 4. A seed magnified.

Plate 9. B. *Calochortus elegans.*

1. A petal, shewing the beard. 2. A stamen. 3. An ovarium, after the petals have fallen. 4. A section of the same, exhibiting the three cells, and the insertion of the ovula at that stage of its growth. 5. An unripe capsule. All slightly magnified.

XXXII. *An Account of some Improvements in the Construction of Hot Beds. By* Thomas Andrew Knight, *Esq. F. R. S. &c. President.*

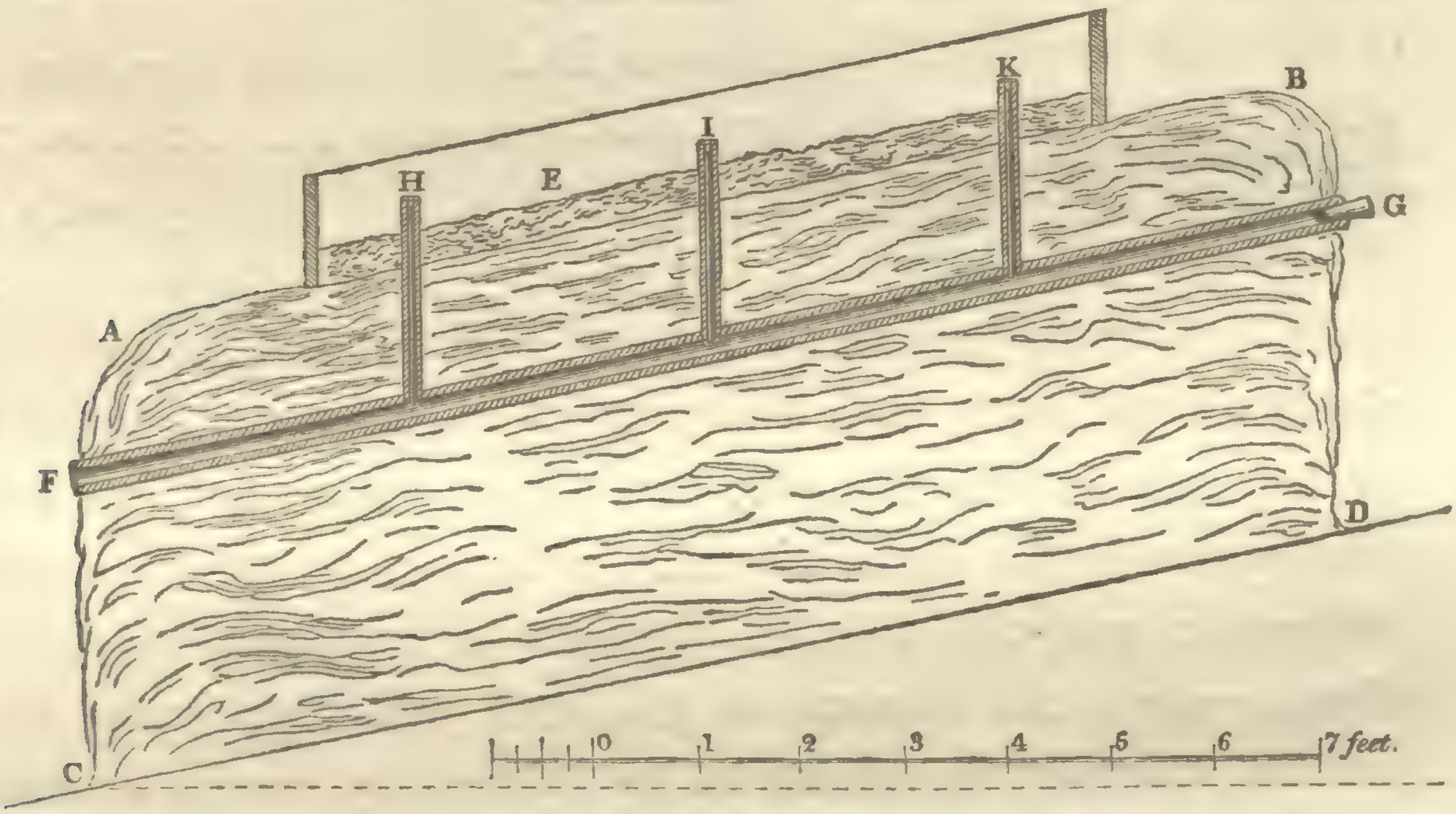
Read July 3, 1827.

I submit an account of a small addition which I have made to the machinery of a common Hot-bed, from the use of which, I believe, that every gardener who has occasion to raise cucumbers, and other plants, in winter, or very early in the spring, will be able to derive very considerable advantages. At these periods of the year, it is not easy to give the plants a sufficiently high temperature, with proper change of air, however well the bed may have been constructed, and with whatever care the material which composes it may have been prepared; and the sudden changes of temperature, which often occur in the climate of England, will frequently subject the roots of the plants to be injured by excess of heat, and the mould, when lying upon horsedung, to be what is called by the gardener *burned*, that is, I believe, so much impregnated with ammonia, that the roots of the plants cannot retain life in it. Another defect of the common hot-bed is, that whilst its interior part is excessively hot, so little heat ascends through the mould, that a covering of glass alone does not afford sufficient protection to any tender plant in very cold weather, during the night.

By means of the machinery which I shall proceed to de-

scrihe and to recommend, abundant air may be given at all times; and so high a temperature preserved, that, with a hot-bed of a very moderate degree of strength, the most tender plant will be perfectly protected without any other covering than that of an ordinary glass light during the severest frost of our climate, provided the spaces, where the panes of glass overlap each other, be perfectly closed.

The annexed design will give a sufficiently accurate representation of the apparatus which I have above recommended.



A, B, C, D, is a hot-bed, resting upon an inclined plane of earth. E, the frame. F, G, a pipe, made of a slender oak pole; and H, I, K, smaller pipes fixed into the larger one, through which the air which enters the latter at F, ascends into the hot-bed. The tube of the large pipe is one inch and a half, and that of the smaller three-quarters of an inch diameter. The smaller tubes have near their upper ends two horizontal apertures, through which the heated air passes laterally into the frame. I consider three of the large pipes to be fully

sufficient to give heated air to a bed twenty feet long; the heated air entering at all times very rapidly, and consequently always keeping all within the frame in motion. The larger pipes might, I conceive, be with advantage made of cast iron.

If the heat of the air be at any time excessive, it may be lessened by opening the end of the tube at G, where it is usually kept closed. The hot-bed, in which I have placed the above described kind of tubes, is composed almost wholly of leaves; but the mass of these is great, and the temperature in consequence high. I immersed a deep pot into the leaves, and caused the heated air of the tube K, to ascend into it, having previously shortened the tube, and fitted it accurately to the aperture of the pot, placing a thermometer, with some eggs of the common domestic fowl within it, with the view of ascertaining whether these could be hatched by such means. I have not yet seen the result; but the temperature of the ascending current of air, which arises into the pot, and of course into the frame, appears never to have varied during fifteen days more than three degrees, the lowest temperature being 101°, and the highest 104°; and it has, of course, been nicely adapted to both the purposes for which it was intended.

I have formerly ascertained, that the power of a current of heated air when made to enter a pit, or chamber of any kind, was found greatly to exceed the calculation which I had previously made; and in the last winter, very contrary to my expectations, a very feeble current of air, the temperature of which was below 50° proved sufficient to preserve geraniums, which were placed close to the glass, in the severest frost, from receiving the slightest injury.

The operation of a hot-bed, into which a pipe is introduced

in the manner above mentioned, has been observed by me only during the spring and part of the summer of the present year; but the results have been so satisfactory, that I can with the utmost confidence, recommend the machinery which I have described, particularly when tender plants of any species are to be raised in cold seasons of the year.

XXXIII. *On the Treatment of the Nymphæa Rubra. In a Letter to the Secretary By Mr.* Christie Duff, *Corresponding Member of the Horticultural Society of London, and Gardener to the* Earl Grosvenor, *at Eaton Hall, in Cheshire.*

Read December 18, 1827.

Sir,

The Nymphæa Rubra had been grown in the Pine stove here for many years, but never produced blossoms, owing, as I considered, to its being too far from the glass, and the temperature of the Pine-stove being generally too low for the developement of its flowers. With this impression on my mind, in December 1826, when its leaves were decayed, I took up the bulbs, or tubers, out of the stone cisterns, in which they had grown for years, and put them into pots according to the size of the tubers, and plunged the pots in water to within an inch of their rims. They remained in this situation in the Pine-stove, till the plants began to show leaves in the April and May following. They were then planted in cisterns, and in glazed earthen-ware pots, in which was the following soils;—in the bottom, four inches of strong clay, made solid, above which was six inches of light mellow loam, and, at the top, an inch or two of sand, to keep the water clear. The cisterns, which are made of Yorkshire flags, and of the following dimensions,—three feet long, one foot eight inches broad, and one foot four inches deep, were placed

upon the end flues of Pine-pits where the fire enters and escapes : and they were elevated with bricks to within eight and twelve inches of the glass. The glazed pots were from fourteen inches, to eighteen inches in breadth and depth, and were similarly placed, except a few that were plunged in corners of the Melon-pits. They were kept constantly full of water, and it frequently was made to run over, in order that the water might be kept pure. The temperature of the Pits was seldom under 80°, and in sun-shine, often above 100° of FAHRENHEIT. No air was admitted at the lights immediately above the plants. As the plants increased in growth, they put out many runners, which were pinched off close to the tuber. When the roots reached the clay, the leaves got very strong, raising themselves on the sides of the cisterns.

The Nymphæa Cærulea and N. Odorata, under similar treatment, produced abundance of Flowers. The first flower of the Rubra opened on the 13th of August ; on the 15th, it was fully expanded, and measured over the disk five inches and a quarter : on the 17th, Sir ABRAHAM HUME saw it, and said it was much larger, and finer than any one he had flowered, or ever saw.

The same plant produced another flower in September, somewhat larger, and with nineteen petals ; and many more buds were formed, but they opened very indifferently towards the end of September ; in October, the plants began to lose their leaves. When this was accomplished, the tubers were taken out of the cisterns, and put into small pots as before stated. The last was done this day.

The Nelumbium Speciosum, in a glazed pot, with similar soil, plunged in leaves in the same pit, has flowered well,

and ripened seeds; while a plant in the Pine stove, although growing freely, has not even showed flower.

I am, Sir,

Your obedient Servant,

Christie Duff.

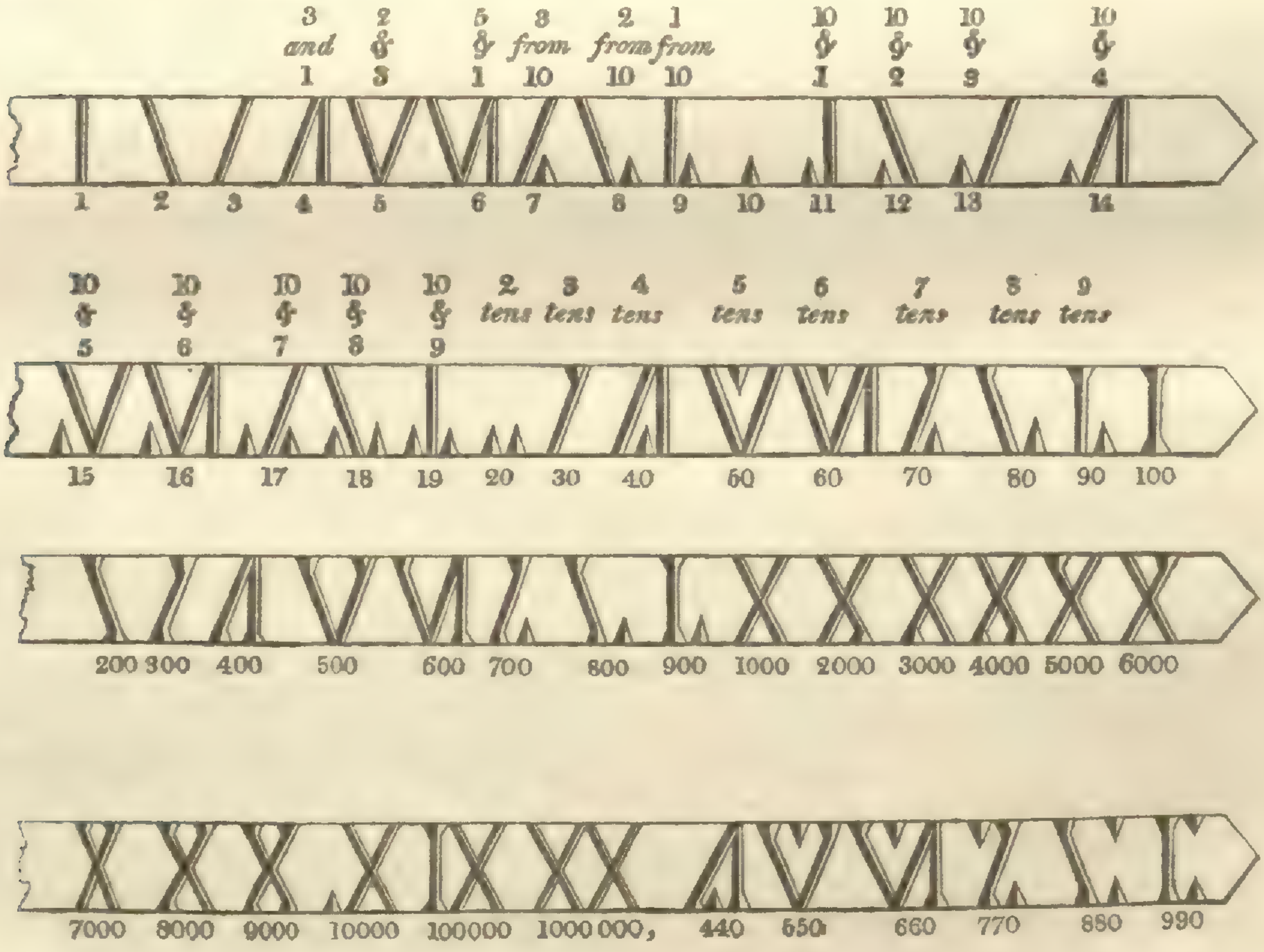
Eaton Hall,
December 11, 1827.

XXXIV. *A simplified Method of marking Numbers on Tallies. In a Letter to the Secretary.* *By* Sir George Steuart Mackenzie, *Bart. F. H. S.*

Read January 1, 1828.

My dear Sir,

In the second volume of the Horticultural Transactions, page 347, there is an ingenious scheme by Mr. Seton for marking Tallies. I beg now to submit one which appears to me more easily retained in the memory; and, on the whole, to be more simple than any hitherto in use, as only four signs are used in combination, to denote numbers up to 1000, when one more sign carries us on to a million: beyond which, I scarcely suppose it will ever be necessary to number.



On reference to the annexed sketch, you will observe that the first three signs, and that for 10, are all that I require. The number 4 is denoted, by joining 3 and 1; 5, by joining 2 and 3; 6, by joining 5 and 1. To denote 7, instead of contriving an arbitrary figure, I use the sign of 3, *prefixed* to that of 10, to denote that 3 is *subtracted* from 10, and 7 remains. In like manner 2 is subtracted from 10, for 8, and 1 is subtracted for 9.

I now take the notch standing for 10, and by placing the signs already made *after* it, it is denoted that they are to be *added* to 10. Then we have two notches for 20.

To denote 30, I use the sign 3, with the ten on the top, denoting 3 tens. For 40, 50, 60, 70, 80, 90, I use the same method, but placing the 10 in the openings of the three first. A hundred I denote by the sign of 1, having a notch *on both ends;* and on the same principle I proceed with the hundreds, till I come to a thousand, which requires a new sign, which, however, is formed of two already in use. For 2000, I make a notch at the bottom of the sign used for 2; and for 3000, at the bottom of 3. We now proceed arbitrarily, and a notch on both legs denotes 4000; on the left arm, 5000; on the right arm, 6000; on both arms, 7000; on both arms, and one leg, 8000; on both arms, and both legs, 9000. Ten thousand is marked by the notch prefixed; 100,000 by the 100 mark prefixed; 200,000 by the 200 mark, and so on. To give a few examples of numbers, 440 is denoted by the sign of 400, and a notch in the opening; also, 550, 660, and 770, 880, 990, by detached notches at the top. Thus it appears, the system of knife marks on wood, is carried as far as it seems likely to be necessary, by means

of the simple combinations of a very small number of signs, maintaining, nearly throughout, a fixed relation to each other; and probably it will not be very easy to reduce it to greater simplicity. It is not probable that, in any garden, it will ever be necessary to carry the marking beyond 1000; but as far as 3000, no arbitrary sign is used; and this exceeds the number of species of any genus of plants likely to be cultivated in ordinary gardens. I have long used irons, on which the common figures are cut, for burning the numbers on wood; and Juniper tallies, with the numbers thus impressed, last a long time. This material, however, is only to be found in plenty, in a few places.

I am, my dear Sir,

yours truly,

GEORGE STEUART MACKENZIE.

Coul, 20th December, 1827.

XXXV. *Upon pruning and managing Dwarf Standard Apple and Pear Trees in a Garden. In a Letter to the Secretary. By Mr.* William Greenshields, *F. H. S.*

Read February 6, 1827.

Sir,

According to your desire, I send a description of the method I have pursued in pruning and managing my Dwarf Standard Apple and Pear Trees, and which I have practised for several years with success.

The first subjects of the following remarks, from their appearance, were planted six or seven years previously to the the commencement of any pruning being given them. In consequence, they required to be very much thinned out, so as to get the branches clear of each other. In thinning, I always bore in mind to cut the old wood off close to the stem, or branch it was attached to; this prevented young wood springing afterwards. When the trees were thinned of the old shoots, as above stated, the young side shoots were what is generally termed spurred in, that is, they were so shortened, that only two or three buds were left on them, and the leading top shoots were shortened to half their length.

The following and every succeeding year, the trees were treated in the same manner as respects the young wood, till they had acquired the desired height, when the leading shoots were shortened, as the side shoots or spurs had been previously. When the leading shoots shew an inclination to grow

very luxuriantly, which is apt to be the case under this treatment, they should be prevented doing so, by cutting off part of the old wood, along with the young shoot immediately above a flower bud. This will prevent the shoot so cut from increasing in length. The spurs must be treated in a similar manner, by cutting off a small portion of the old wood along with the young, where they are getting too long. I have never found the above treatment prevent the fruit swelling, or in any way detrimental to it, but, on the contrary, it was always improved.

Young trees are to be treated in the following manner. If there are more than three shoots on the plant, reduce them to that number, and shorten each to three, four, or six eyes, according to their strength. The following season, reduce the number of leading shoots to six, and shorten them to three-fourths of their length, and spur in the remaining shoots. The tree should be managed in every respect in this manner until it has attained the required size, which of course depends on the convenience or fancy of the owner, or conductor of the garden.

I make a point of letting the trees take their natural form of growth as far as the system described will permit; for I consider it of little consequence what shape is given to the tree, provided my end is attained; that is, to make every branch as it were a long spur, with bearing buds, from the base to the extremity.

Two or three year's trial of this method only, might possibly deter many from a continuance of it, in consequence of the quantity of young wood which will be produced yearly at first, and from the apparent difficulty of getting rid of the

superfluity. But the inconvenience will be ultimately surmounted, if the foregoing instructions are attended to, and the consequence will be the possession of both healthy and fruitful trees. To attempt to bring very old trees into this method of management, would be attended with difficulty, unless they were cut down short, and allowed to make new heads, which I should recommend where their produce can be spared for a time. In a few years fine healthy heads would be formed, which will yield fruit superior to any that could be expected from them, if left in their rude state. But if the trees cannot be spared to be headed down, they may be very much improved, by thinning out the spray, and cutting away a few old branches, which will cause them to throw out young shoots, and these, in a short time, will become bearing wood. The remainder of the old branches may then be thinned out with effect. Even if this process is only performed once in two or three years, and the stems and branches well cleared of moss and dead bark, it will be of great service to the trees, be a means of keeping them free from insects, and give them a neat and clean appearance.

I am, Sir,
your obedient humble Servant,
WILLIAM GREENSHIELDS.

Englefield, near Reading,
January 4th, 1827.

XXXVI. *A Plan for transplanting large Forest Trees in Parks. In a Letter to the Secretary. By* Sir Charles Miles Lambert Monck, *Bart. F. H. S.*

Dear Sir,

Since, I find you of opinion that, the furnishing of our parks with forest timber, and of our pleasure grounds with exotic trees are objects within the intention of the Horticultural Society; I shall proceed to communicate the particulars of a Method, which I have discovered and practised, for those purposes, with success.

This place is better furnished with trees of shelter and ornament, than most in this part of the country: But, they are very old. Some have died out, and many of those, which remain, shew signs of declining strength, with which, according to my taste, their beauty declines also. Being desirous to maintain that, which others admired, and invited by the stature of the trees then standing here, which shewed a soil capable of bearing them large and handsome, I began, many years ago, to plant single trees in my park, after the methods, which I saw used by my neighbours and others; planting sometimes small, sometimes large trees, and fencing them variously; some with thorns, and others with posts and rails. When their height required it, they were staked and bound: But, my Success was small; whilst the expences and pains were great, and the disappointments vexatious. To both large and small plants of trees the fencing with posts and rails, which must be renewed once at least, more often twice or thrice, before the trees are proof against the assaults of cattle,

is very expensive. If the plants are large and tall, in which case, one renewal of the fences may be sufficient; the securing of them with stakes and bandages, against displacement by winds, is both expensive and troublesome. If the plants are small, little stakeing is required: But, then two sets at least of posts and rails will be necessary. Tired by frequent disappointments, and by the slow progress even of those, which succeeded, I considered what new methods might be tried. This is a country abounding with stone, and, as my quarries, out of which I was building a new mansion, afforded much refuse stone in large lumps, I made a trial by planting some trees of about eight feet height, and placeing at their feet two two-horse cart loads of rough lumps of stone, not built up high, but, packed close by each other, and set on edge so, as to make a tabular, but, very rugged surface round the foot of the tree, and extended to the distance of four feet, as is represented by the figure.

These trees succeeded well, and far beyond my expectation. On considering the cause of their success, it appeared to me, that the stones served the three purposes of fencing, stakeing, and mulching: The first of which is always necessary, to defend them from the assaults of cattle: The second is equally so if the plants are tall, to save them from being displaced by winds after they shall have

taken fresh root: And the third also is necessary in case of a dry summer, the first after the transplantation of the trees, to protect the soil from over drought, whilst they are striking fresh root into it. The stones placed, as I have described are a sufficient fence against horned cattle, which, having feet made for going upon soft ground, will not mount the rugged surface of the stones. Sheep and deer will scarcely annoy trees ,whose bark has acquired roughness: But, they may be easily repelled by a few thorns bound round the lower part of the stems. Nor, will common horses go upon the stones, or endeavour to reach the trees, and tear off the bark. But, against high bred horses, which are disposed to attack every thing of wood, the stones are not a sufficient fence, unless, they are packed with a surface very rugged, and extended six feet round the tree. Against displacement by winds, the stones are a better security, than can be provided by any manner of stakeing and binding; for they are a power always in action by their weight, and the surface of the soil is shaded by them from the too great power of the sun, whilst the rains sink through and encourage the roots to sprout afresh and extend themselves through the soil: Thus they serve the purpose of mulching.

As a provision for these purposes of stakeing and mulching, I consider the stones more certain and perfect than, for that of fencing. Some horses will always endeavour, and sometimes succeed in reaching and tearing the bark: But, the weight of the stones, as a security against displacement by winds, excels any stakeing because it is constantly in action: Once sufficient, it is always so: But, the bandage, with which the tree is secured by stakeing often decays and becomes loosened, and the tree is displaced before the failure of the

bandage is discovered and repaired. Besides I have observed, upon taking up some young trees, which upon a former transplantation in the Nursery had been staked, that, the part of the stakes sunk in the ground had, in their course of decay, produced a mouldiness in the soil about them, and the trees had refused to strike fresh roots in that direction; or if, they had struck any, the mouldiness in the soil had caused them to decay.

The best trees, to plant out, are certainly those, whose roots and heads have been properly trained by pruning and cultivation in a nursery: Such may be planted out at greater ages and sizes than trees taken from plantations of a few years growth, and will both strike fresh root more certainly, and grow faster: But, these last may be taken up, when from ten to twenty or twenty five feet high and planted out with full success; provided the three following particulars are observed: First, to get up as much root as possible: Next, to reduce the branches down to due proportion with the root, which has been got up. This very important particular in the operation was suggested to me by my neighbour and friend, the Rev. John Saville Ogle of Kirkley: A great part of the roots is unavoidably lost in the taking up of the tree, and it is the most efficient part, being the extreme fibres: The root has thus lost its natural proportion to the head, and is now insufficient to supply it with moisture. Trees planted out in this state, often, after having put forth their leaves, die suddenly: And others, which continue to live, will fall into a languid state, and die off gradually, or, recover their vigour very slowly. Thirdly, in planting the trees afresh, care must be taken to spread all the roots evenly,

none being allowed to be curled round or turned up at the ends. It is not necessary, to preserve and carry any earth about the roots. Autumn, immediately that, the leaf is fallen, is the best season for the work; and by careful practice, according to the method above described, I have had perfect success in transplanting trees of from eight to twenty feet high.

It must not be thought that, I take upon me to teach how, a well trained young tree from a nursery, or, a thriving one from a young plantation may be transplanted, and made to grow well in a soil not qualified to bear fine timber. I only endeavour to shew to the Society, from my own experience, how grounds, adapted by nature to the growth of fine timber, may be more certainly and speedily furnished with it, than, by the methods, which we have hitherto seen commonly used.

I have the pleasure to remain, with much regard, yours

CHARLES MONCK.

Belsay, 15*th January*, 1828.

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It is likewise necessary, on this occasion, to remark, that it is an established rule of this Society, to which they will always adhere, never to give their opinion as a body, upon any subject either of Nature or Art, that comes before them. And therefore the thanks which are proposed from the Chair, to be given to the Authors of such Papers as are read at the General Meetings, or to the Persons who send fruits, or other vegetable productions, or exhibit Inventions of various kinds to the Society, are to be considered in no other light than as a matter of civility, in return for the respect shewn to the Society by these communications.

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XXXVII. *An Account of Scotch Pears. In a Letter to the Secretary. By Mr.* Archibald Gorrie, *Corresponding Member of the Horticultural Society.*

Read December 4, 1827.

Sir,

Having forwarded two parcels containing specimens of Scotch Pears for the Society on the 21st of September and 19th of October, I now, agreeably to my promise, report the peculiarities of the fruit.

Had I confined my attention to such varieties as were known certainly to be of Scottish origin, the list would have been very limited. It now consists of those which, as I believe, are either cultivated in Scotland exclusively, or from their excellence have been transferred from Scotland to England.

During the monkish ages the greater part of our Apples and Pears were introduced to Scotland from France and the Netherlands, and cultivated near the abbeys by the ecclesiastics; and, from the old trees to be met with at such places, it appears that the *Charnock*, or *Drummond*, the *Crawford*, the *Christie*, and the *Longueville* (a French Pear,) were favourites with the ghostly fathers. It is also not improbable that the art of raising fruit trees from seed was at that period known and practised. This conjecture is strengthened by the fact, that in almost every very old orchard one or two trees are to be met with which are to be found no where

else, except where the merit of the fruit has attracted the attention of nurserymen, by whose means they have been transferred in later times to other orchards; for instance, the *Red Pear of Busie*, a beautiful, small, and good early Pear, is only found on young trees, except in the orchard at Busie, about a mile north of Perth, where the original tree is still standing, though in a state of much decay. The *Benvie* is more extensively cultivated; the original tree, or rather a part of its remains, is still alive in a small orchard on a farm of that name, to the east of Rossie Priory, in the Carse of Gowrie. *Pear Duncan*, a beautiful Pear, little known, till very lately was only to be found at Gourdie Hill, the seat of PATRICK MATHEW, Esq. in the parish of Errol; that gentleman has given it deserved celebrity; it takes its name of Duncan from a former proprietor of Gourdie Hill. The *Flower of Monorgan* is found no where but in the extensive orchard of that name. The *Black Pear of Bog Mill* is only found in the orchard there; and the *Busked Lady*, and *Pow Meg*, are peculiar to the orchard of Port Allan, on the north bank of the Tay, opposite to Newburgh. The *Elcho Pear* seems to be an accidental seedling, now cultivated at the old castle of Elcho. And many varieties of inferior value are to be found in almost every very old orchard, whose qualities have not procured for them any culture beyond the precincts of their original habitation. Every orchard of long standing has its own *Pear Diel*, and no one Diel is like another; neither does any orchardist covet the Diel of his neighbour. The *Pear Worrys* are about as various, and are deservedly treated with the same neglect. There are also many sorts which no one has ever thought of dignifying with names. As these are fast disappearing from

the land I did not think of troubling you with specimens, knowing that I had sent many that had acquired "a local habitation and a name," which will in the South be doubtless consigned to oblivion. The numerous varieties of inferior quality which I have met with convince me that during the times of popery, fruit trees were raised from seed; and if I am right in this conjecture, then most likely many of the specimens which I have sent you are genuine Scotch Pears, if not, some of them may be found in England though under other names. Where no more correct data exist than an old tree being found exclusively in a certain orchard, it would be little short of presumption to fix on that orchard as the place of its origin. I must therefore beg to be understood as advancing nothing positive on that head, nor do I think that such antiquarian research could be attended with much practical utility. I have attended more to obtaining the local names whereby the different varieties are generally known in the orchard or market; and here I had some difficulty to encounter, for amongst orchardmen the synonyms are endless; I have therefore adopted the most generally popular name, and rejected all synonyms as only calculated to mislead. There is only one original *Benvie Pear*, viz. the Early Yellow Benvie, but the *Autumn Benvie* being something like this favourite Pear in shape, has obtained the honor to be called by its name, although no way like the true Benvie in the habit of the tree or quality of the fruit. Whenever I attempted to reason with fruit dealers on the absurdity of this nomenclature, they uniformly told me that they passed in the market for Benvies, and I had no resource left but to put up with names which usage had sanctioned.

The *Gold*, or *Gowd Knap* too, is a very convenient name for small round gold coloured Pears, and no less than five varieties are sent under that name, all rare, except the earliest, which I conceive to be the genuine variety of the name.

In describing the varieties, I have confined my remarks to the leaf, its pubescence, smoothness, serratures, and shape, and the length of the footstalk; and I may notice here, that I have found smooth leaves for the most part deeply serrated on the sides, and the pubescent leaves much less so, particularly when the leaves are old. At that time, the serratures which appeared slightly on their unfolding are generally filled up. In my descriptions, the size and habit of the tree are generally noticed; the time the fruit is ripe, and in season, and its colour and quality are mentioned; for the size and form of the fruit I refer to a sketch of the outline of each, which will shew these as well as the length of the footstalk, and the position of the calyx; when a footstalk is mentioned in the descriptions it is always that of the leaf that is meant. I attempted to distinguish between the flowers of the different varieties, but have not copied my notes so far, for I found they would only lengthen the descriptions without producing any useful practical result.

I have added sketches of a few Pear trees, the elegant appearance of which, I conceive, entitle them to a place in the lawn, in groups, or solitary, according to the fancy of the proprietor or landscape gardener. The Early Yellow, or Genuine Benvie, is a towering tree, shewing its waving top far above its round-headed fellows; and from its slender and graceful appearance, it is always known at a distance; it is found in every orchard. The sketches of the Pow Meg and Busked

Lady, are taken from the original trees at Pow of Errol, now Port Allan; that of the Elcho Pear from a tree near Elcho Castle; and that of the Genuine Gold Knap from a tree standing in the orchard at Bog Mill. Nothing can be conceived more elegantly beautiful than the appearance of this tree, either in spring, when literally covered with snow-white blossoms, or in autumn, when its pendent and healthy looking branches are loaded with gold-coloured fruit. The tree at Bog Mill generally yields from thirty to thirty-five bushels of fruit annually. The Busked Lady, a name importing a lady in full dress, is also an immense bearer, and its glossy fruit has a striking appearance in the autumn months. The fruit is ripe about the same time with the Pow Meg, Elcho Pear, and Gold Knap. I have made these observations in order that those who wish to combine beauty with utility, may have it in their power to introduce such trees into their lawns.

My other avocations prevented me from visiting the orchards of Clydesdale, but PATRICK MATHEW, Esq. of Gourdie Hill, a most zealous and judicious orchardist, just returned from a tour through that district, reports to me, that with the exception of a variety called the *Iron Pear*, there is nothing of importance in that quarter which I have not in my collection. To that gentleman I have been much indebted, not only for supplying me with many specimens peculiar to his own orchard, but also for assisting me in arriving at the local names of fruit in other orchards. I am also obliged to JAMES HUNTER, Esq. of Monorgan, for very politely assisting me to select several rare varieties from his extensive orchards; and to my professional brethren, Messrs. MACRAY, late at Errol; to Mr. KINMONT, at Murie, and to

Mr. Young, at Pitfour, my acknowledgements are due, for assisting me in procuring several varieties. The *John Monteith Pear*, and *Green Pear of Pinkie*, are two supposed Scotch varieties, of which I could not procure specimens, and descriptions of them are consequently wanted.

It should be remarked that all Pears in the present season are much smaller than ordinary, and hence the specimens and figures sent are under the usual size.

I have the honor to be,

Sir,

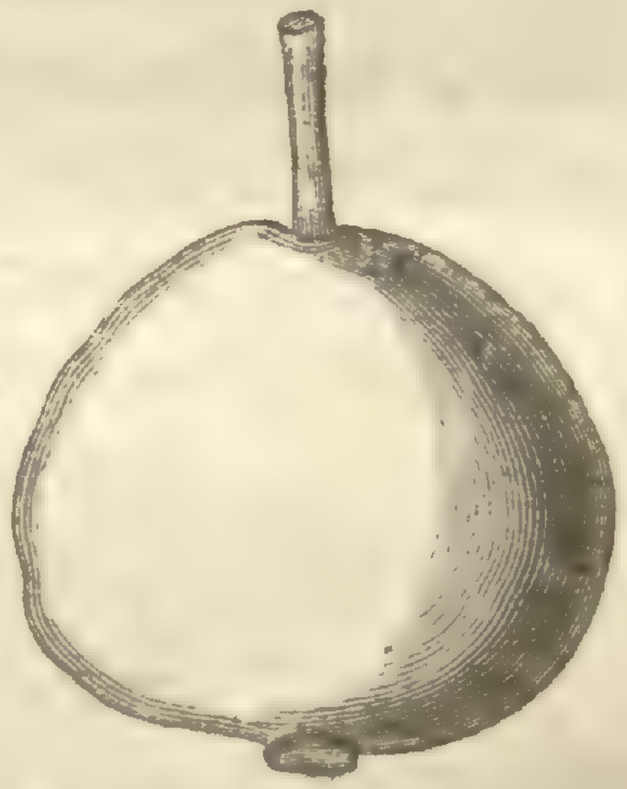
your obedient and humble servant,

Annat Gardens, Perthshire,
November 18, 1827.

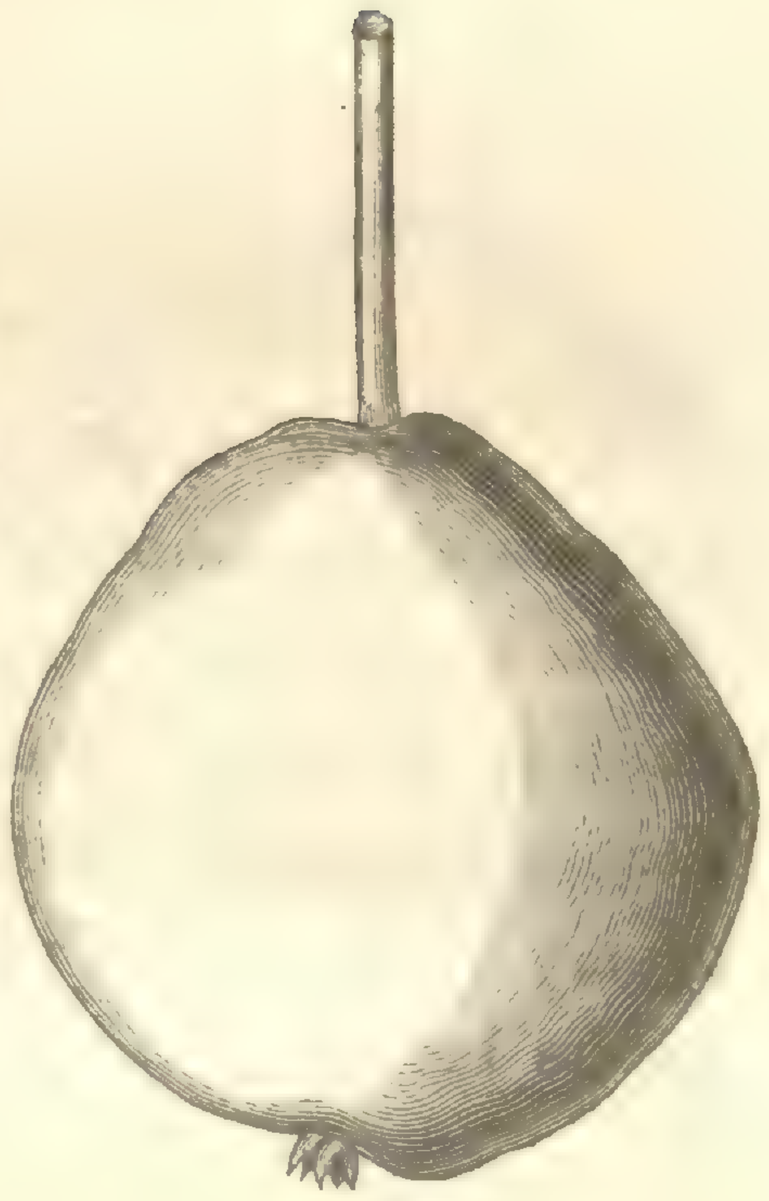
Archibald Gorrie.

Description of Scotch Pears.

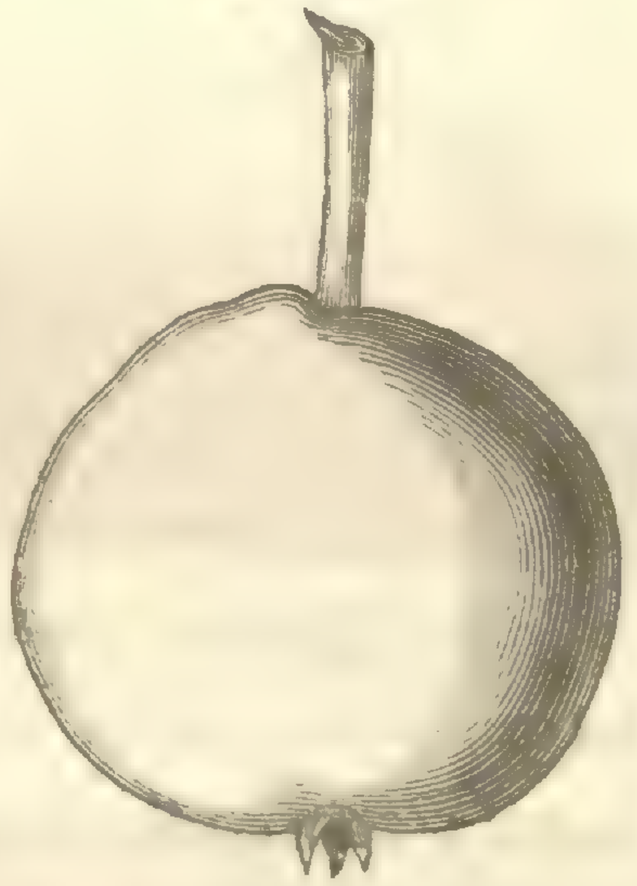
I. *Busked Lady* Leaves slightly pubescent, long,very slightly serrated; footstalks strait. Fruit ripe in the end of October; in season in the middle of November; colour, vermilion tinge next the sun, glossy white on the other side. Tree round-headed, lofty, healthy; branches slightly pendulous. Fruit may be sent to table. Merits attention.



II. *Michaelmas Achan.* Leaves smooth, obovate, serrated; footstalks short. Tree lofty. Fruit ripe in middle of September; juicy, sweet; does not keep; ripens very irregularly; colour light green.

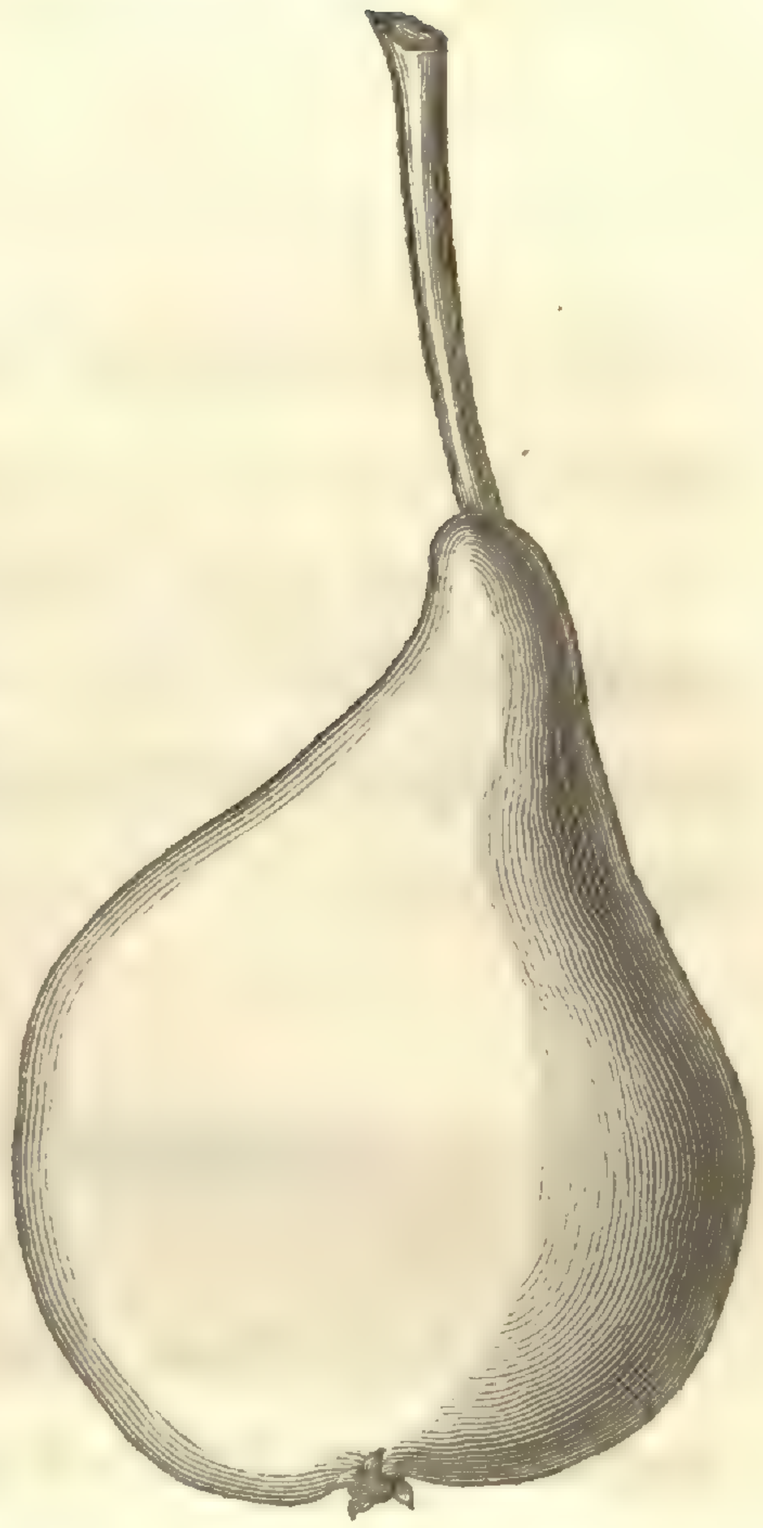


III. *Red Pear Diel.* An immense bearer. Tree lofty. Fruit red next the sun, greenish yellow on the other side; taste indifferent; ripe, end of October; keeps a month. It is only useful to such as wish to impose a bad article on Pear dealers.

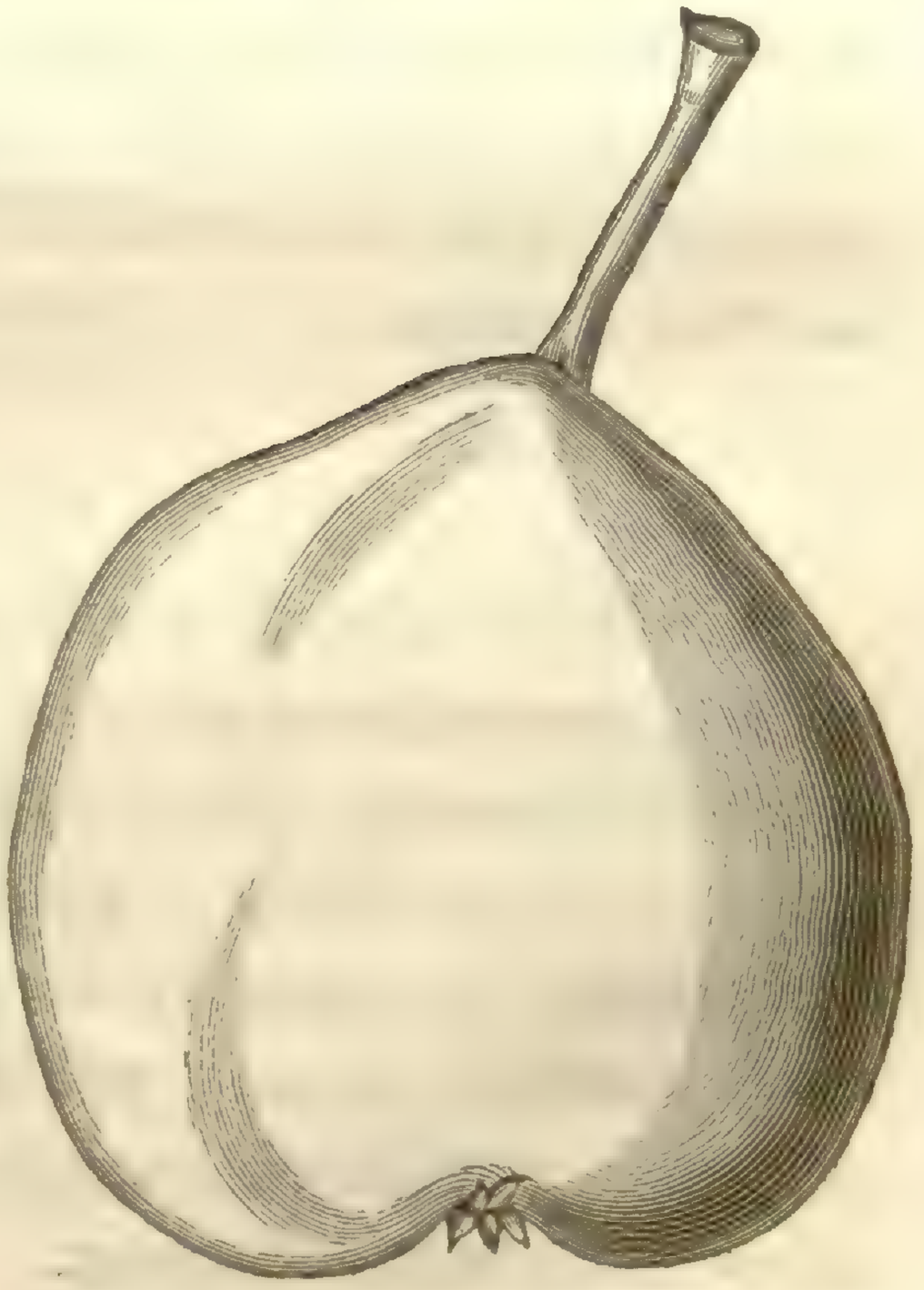


IV. *Apple Pear.* Leaves almost round; footstalks short; leaf smooth, slightly serrated. Tree lofty, round headed; a shy bearer. Fruit ripe in the middle of October; keeps about three weeks; colour, red next the sun, glossy, yellowish white on the other side; soft and sweet.

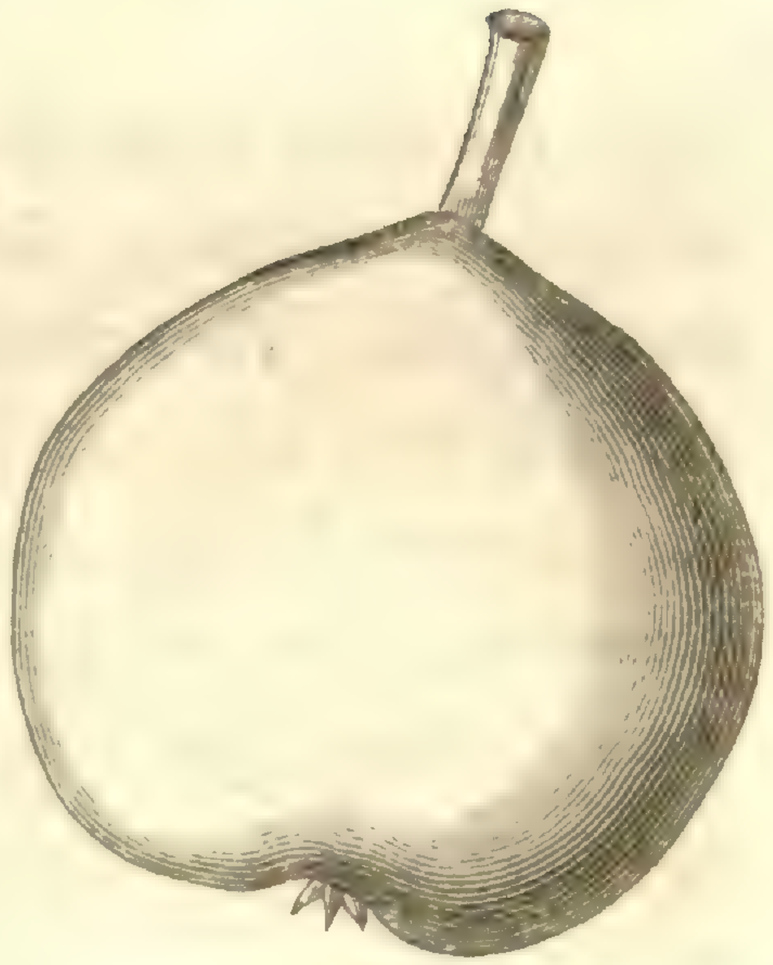
V. *Elshin Haft, or Wall Pole.* Leaves acute, smooth, serrated; footstalks moderately long. Tree rather conical, healthy. Fruit ripe end of October; taste indifferent; colour, glossy yellow. Cultivated merely for its beauty.



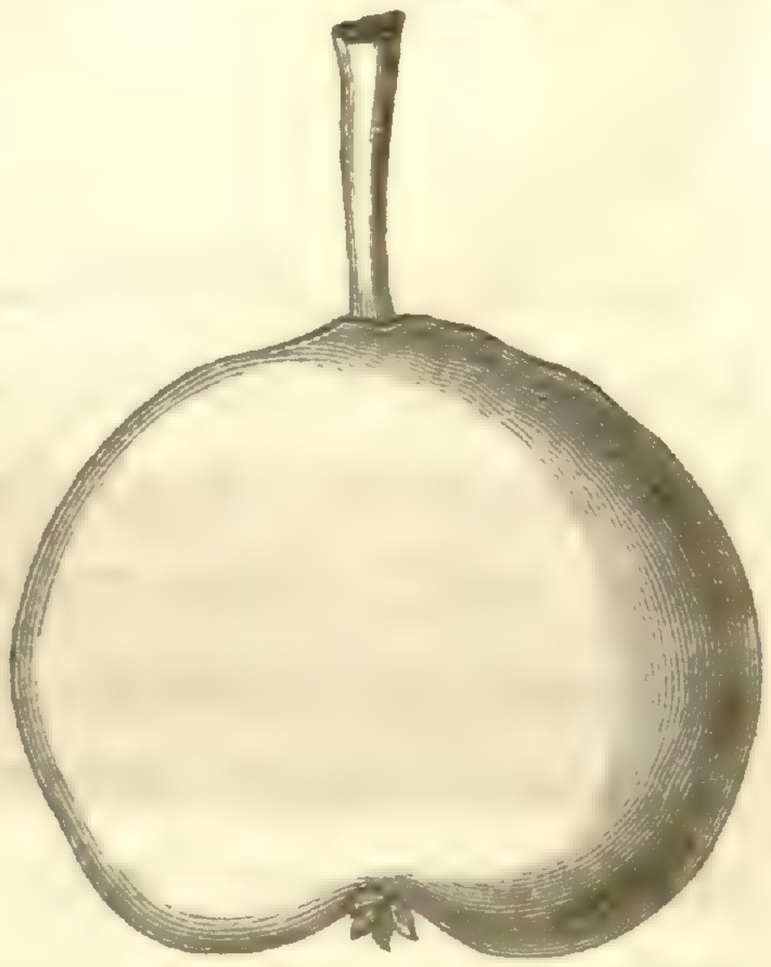
VI. *Briery Bush.* Leaves large, lanceolate, smooth, serrated; footstalks long; a great bearer. Tree round-headed, not lofty; branches pendulous. Fruit ripe middle of October; does not keep; may be used as a dessert Pear; colour, dull red next the sun, green on the other side.



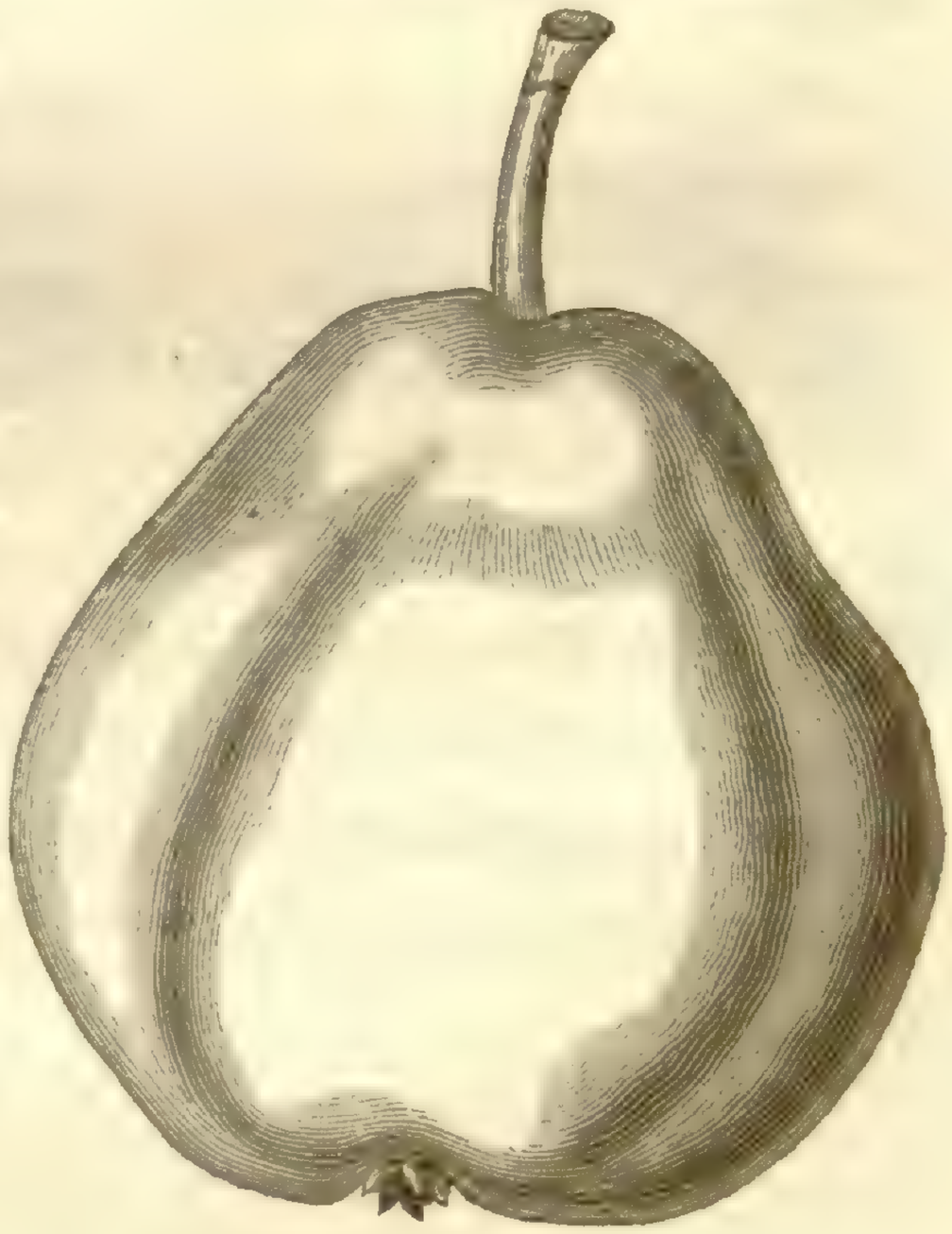
VII. *Grey Good Wife.* A west-country Pear. Leaves round, smooth, serrated; footstalks short, slender. Tree round-headed, dwarfish. Fruit ripe beginning of October; sweetish but gritty; colour, dark, spotted; indifferent.



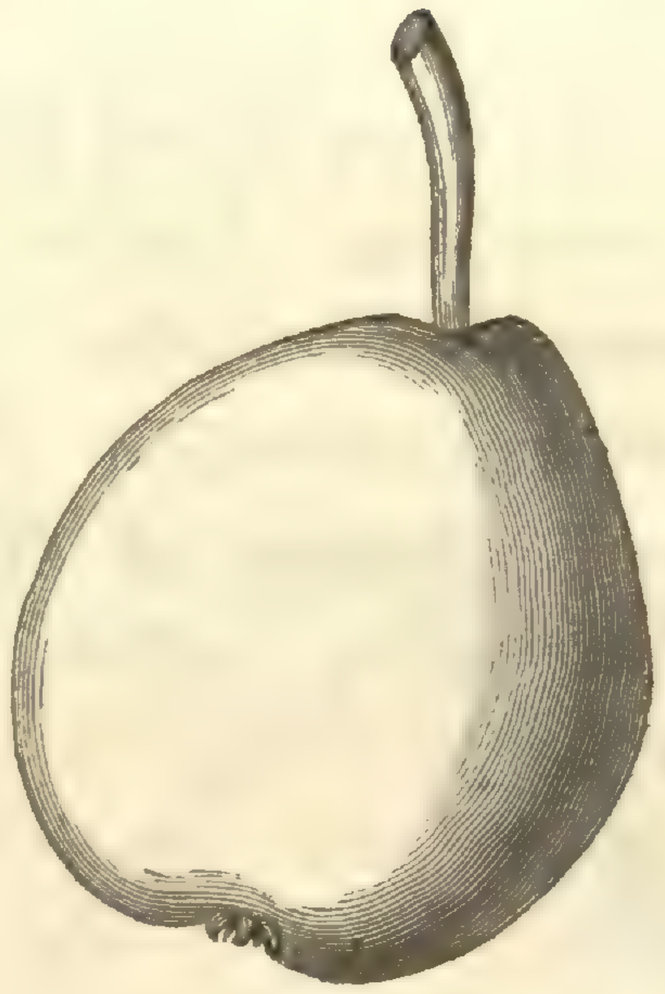
VIII. *Lodge Pear.* Leaves obovate, smooth, slightly serrated. Tree moderate size; bears tolerably. Fruit only fit for baking, and rather small for that purpose. Not worth cultivating.



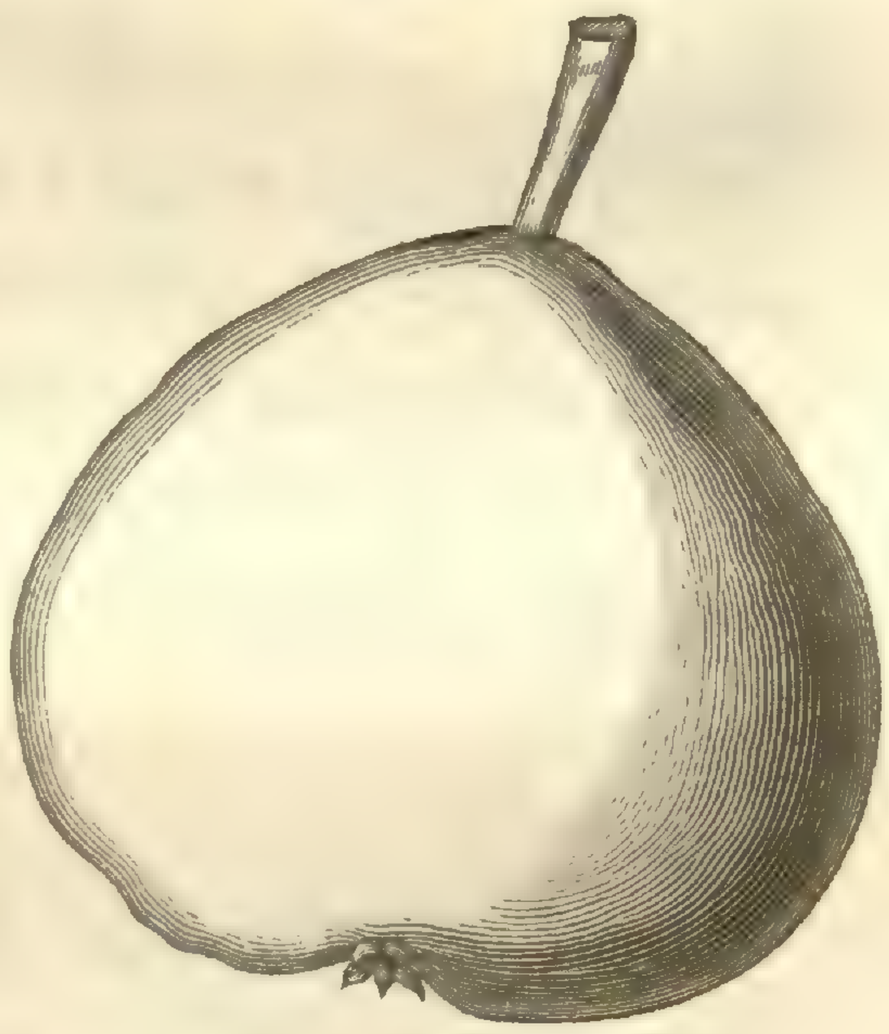
IX. *Early Christie.* Leaves large, semi-cordate, smooth, serrated; footstalks long, slender. Tree rather lofty, straggling. Fruit ripe in the end of September; keeps two to three weeks. A popular market Pear, but hardly deserves a place in a private collection. Taste rather insipid; colour, dull red next the sun; greenish yellow on the other side. A moderate bearer.



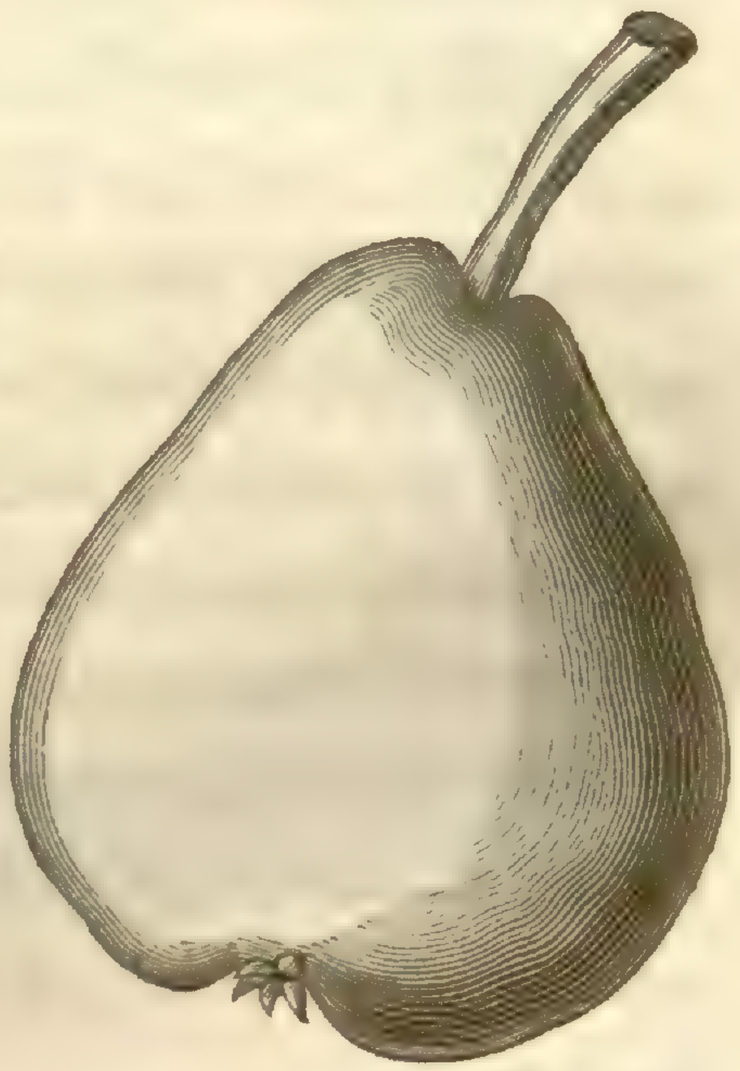
X. *Genuine Gold Knap.* Leaves smooth, serrated; footstalks rather short. Tree almost cylinder-shaped, very tall; an immense and sure bearer. Fruit ripe middle of October; does not keep above two weeks; flesh free, firm, sweet, and agreeable, but sometimes gritty; colour gold.



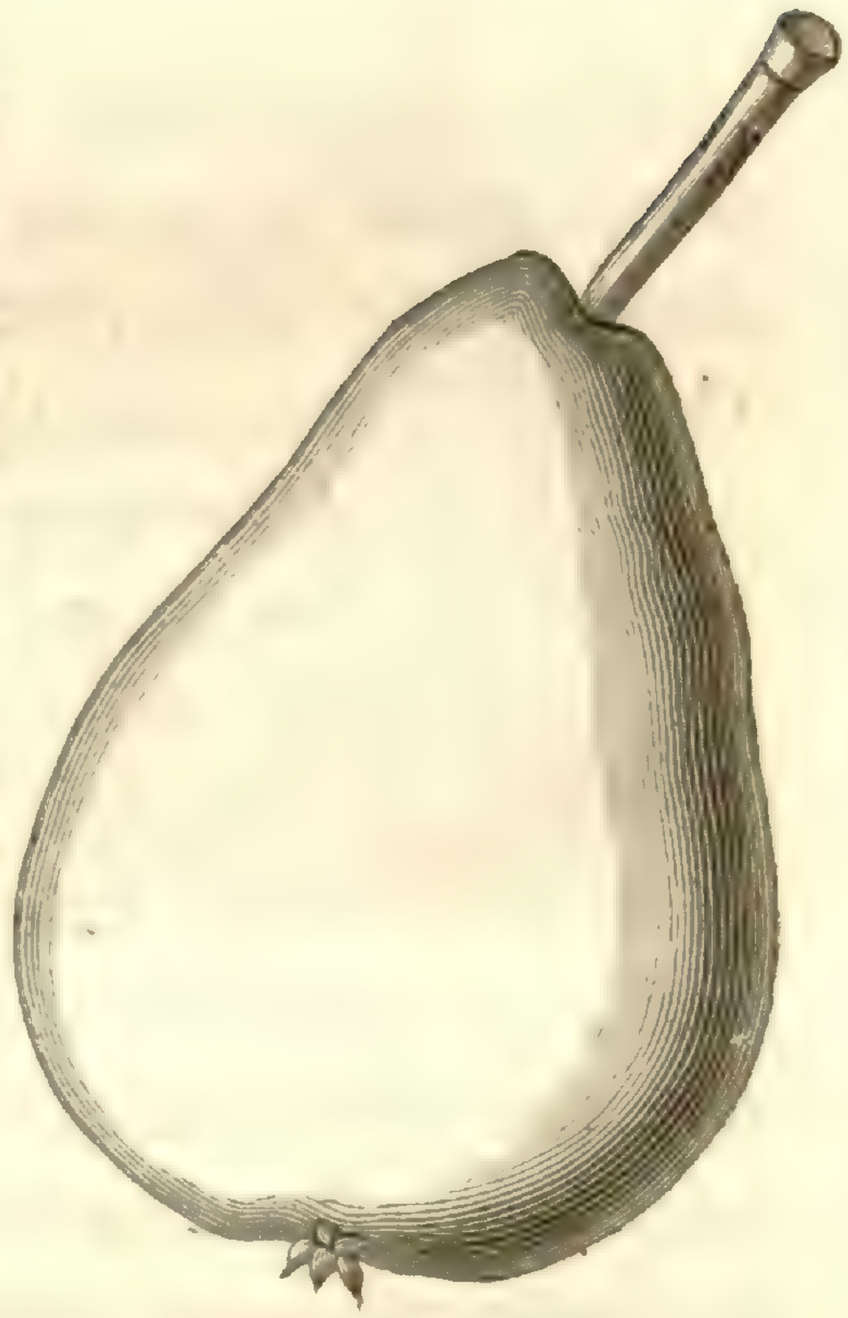
XI. *Scot's Bergamot.* A good bearer; leaves smooth, oblong, acute, not serrated when old; branches erect, stiff. Tree rather dwarfish, disposed to canker. Fruit ripe in October; keeps about a week off the tree; colour, light yellow when ripe.



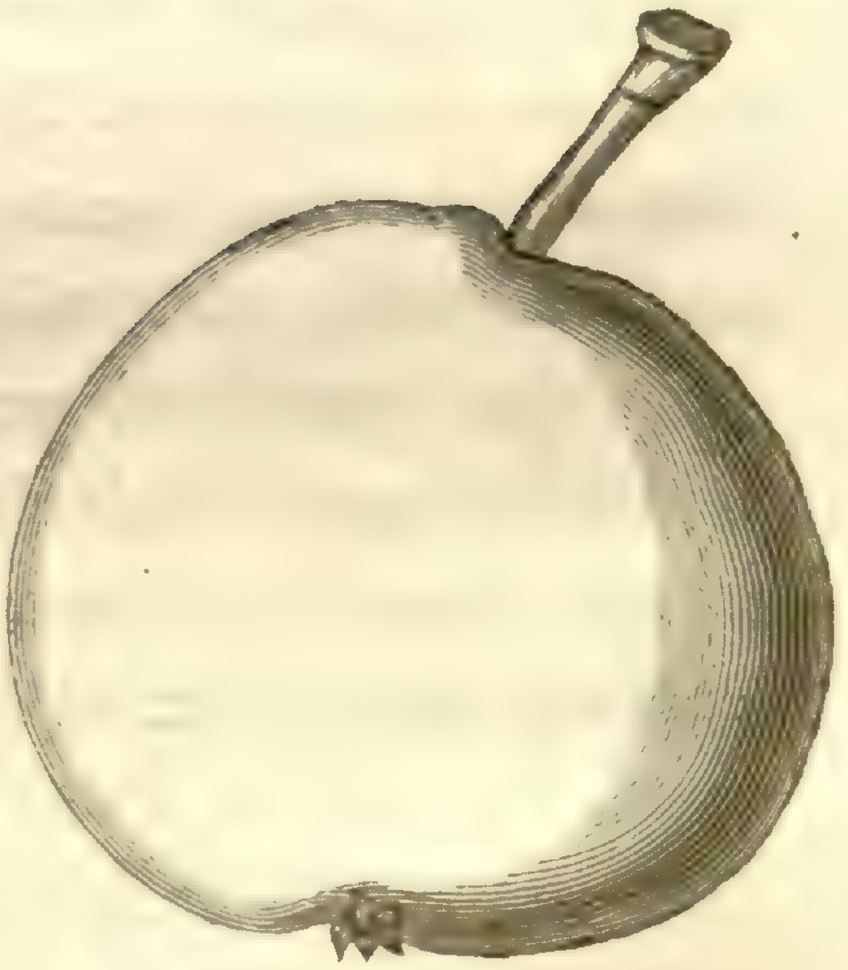
XII. *Green Pear of Yair.* A well known Pear, and a sure bearer. Leaves slightly pubescent, bluntly serrated. Tree tall, branches straggling. Fruit ripe in the end of October on standards; keeps two or three weeks off the tree; colour, pea-green. Is extensively cultivated.



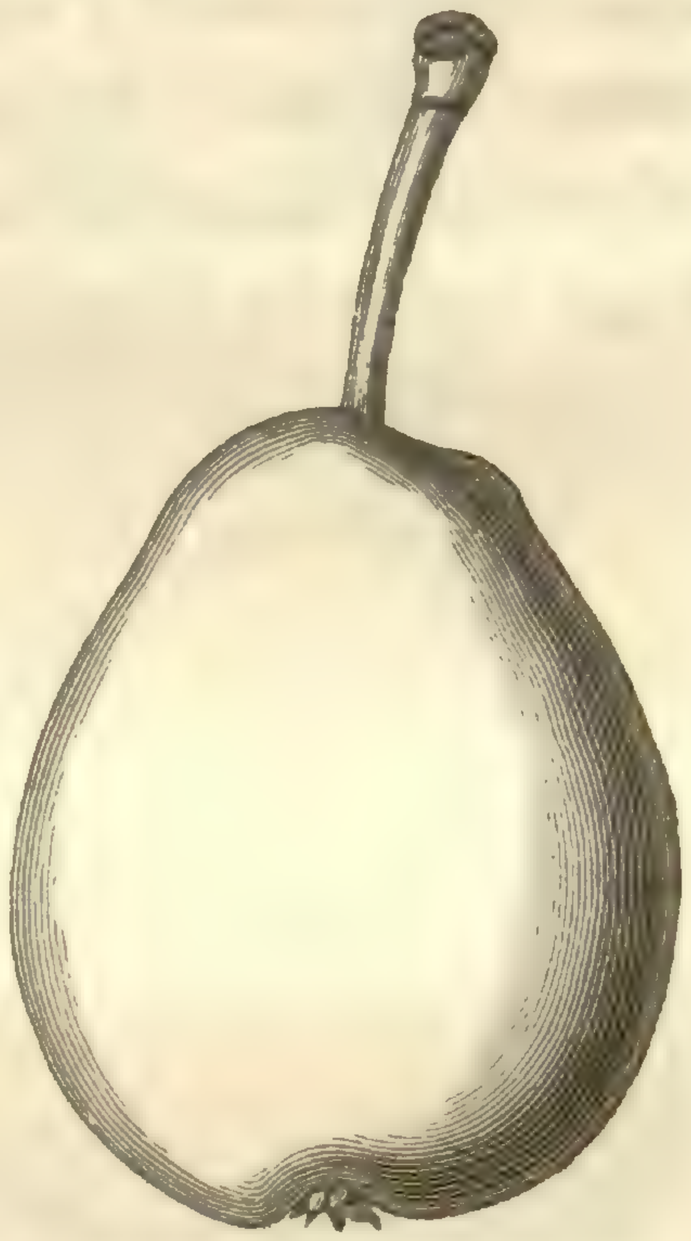
XIII. *Charnock, or Drummond.* Leaves longish, acute, slightly pubescent, minutely serrated. Tree lofty, branches straggling, pendulous. Fruit ripe middle of October; eats mealy when kept a week; ripens irregularly; colour, red next the sun, green on the other side. Is by no means a first rate Pear, and only a moderate bearer.



XIV. *Muirfowl Egg.* Leaves slightly pubescent, when young slightly serrated. Tree dwarfish, round headed; branches horizontal. Fruit ripe in the end of September; should be eaten from the tree, does not keep; taste sweet, juicy. Should be sparingly cultivated.



XV. *Hazel Pear.* The history of this Pear is doubtful; some affirm it to be a native of the Netherlands, introduced some fifty years ago, to Meikelour, Perthshire, by Colonel MERCER, at the same time with the White Beurré. If so, it must have soon disappeared, for there was no vestige of it at that place twenty-five years ago. Others say it is a seedling of the Kinnoul nurseries, and sent in the way of trade to Newcastle, about thirty years ago, under the name of the Grey Beurré, and the variety at Kinnoul having been lost, it found its way back there in the same way, under the name of the Hazel Pear; at all events it is certainly by far the best of our orchard autumn Pears, growing freely, bearing early, and plentifully; it is a fine market Pear, and with many a favourite dessert Pear; we have no old trees of the sort. The

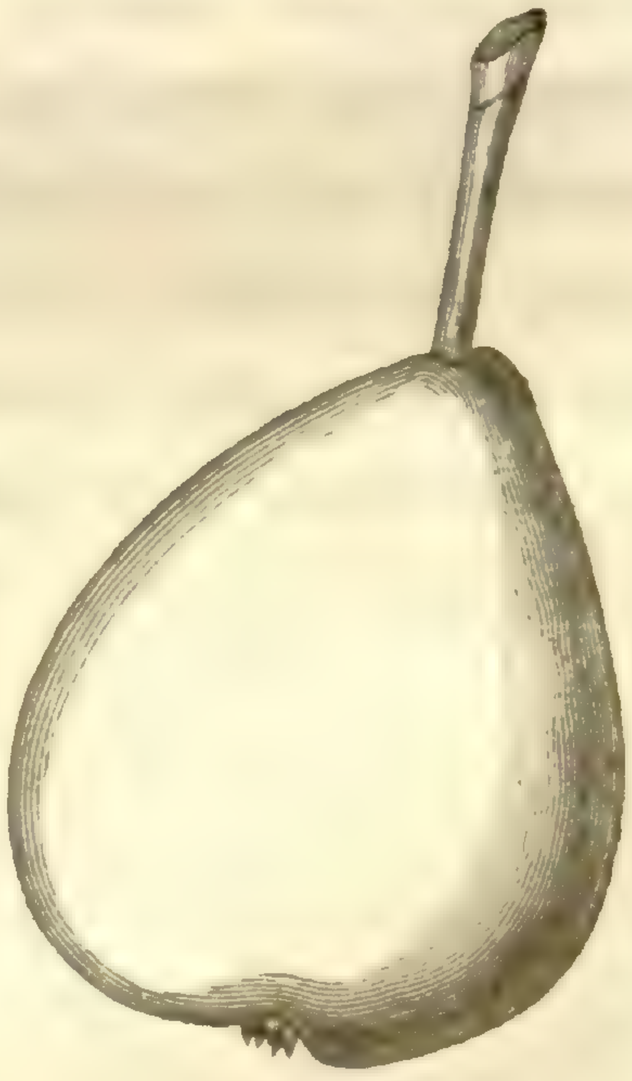


leaves are long, acute, very slightly pubescent, when old not serrated; footstalks very long. Tree a free grower. Branches rendered pendulous by the loads of fruit they regularly bear. Fruit ripe towards the end of October; keeps a few weeks; colour, yellowish, strongly freckled. It is coming fast into most extensive cultivation.

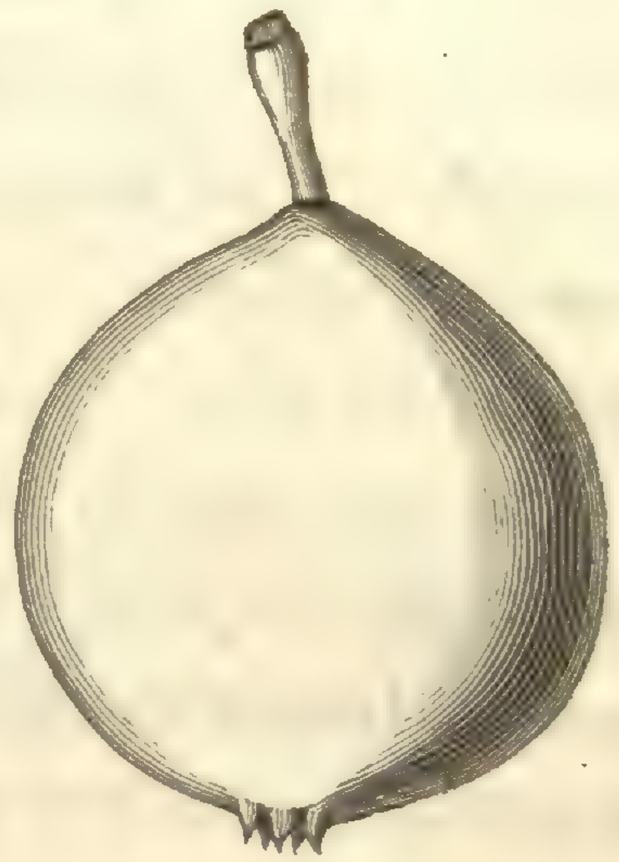
XVI. *Yellow Pear of Bambriech.* Leaves longish, acute, pubescent, not serrated. Tree when old has a skeleton appearance; it seems to have outlived its time. Fruit ripens irregularly in the end of September; bears moderately on young trees; taste sweetish, flesh rather tough; does not keep; colour, beautiful red and yellow.

XVII. *Pease Meal Pock.* A Pear that rots on the tree in September; it has not one redeeming quality to justify me in giving the trouble to read the description.

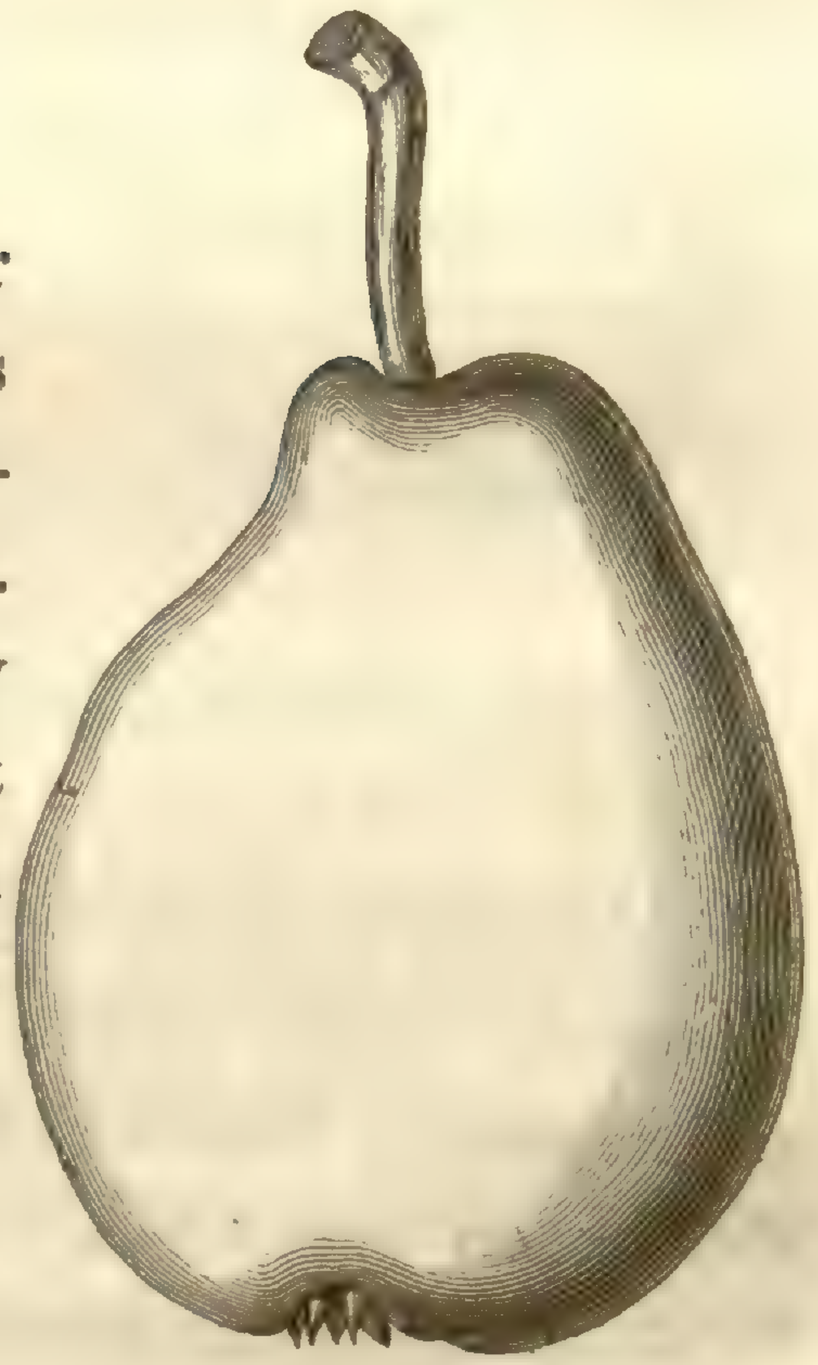
XVIII. *Yellow or Genuine Benvie.* A general favourite. Leaves rather egg-shaped, smooth, slightly serrated; footstalks long, slender. Tree very tall, slender; branches erect, but pendulous on old trees. Fruit ripe in September; a fair bearer, and an excellent table Pear; keeps a few weeks; colour, light yellow when ripe.



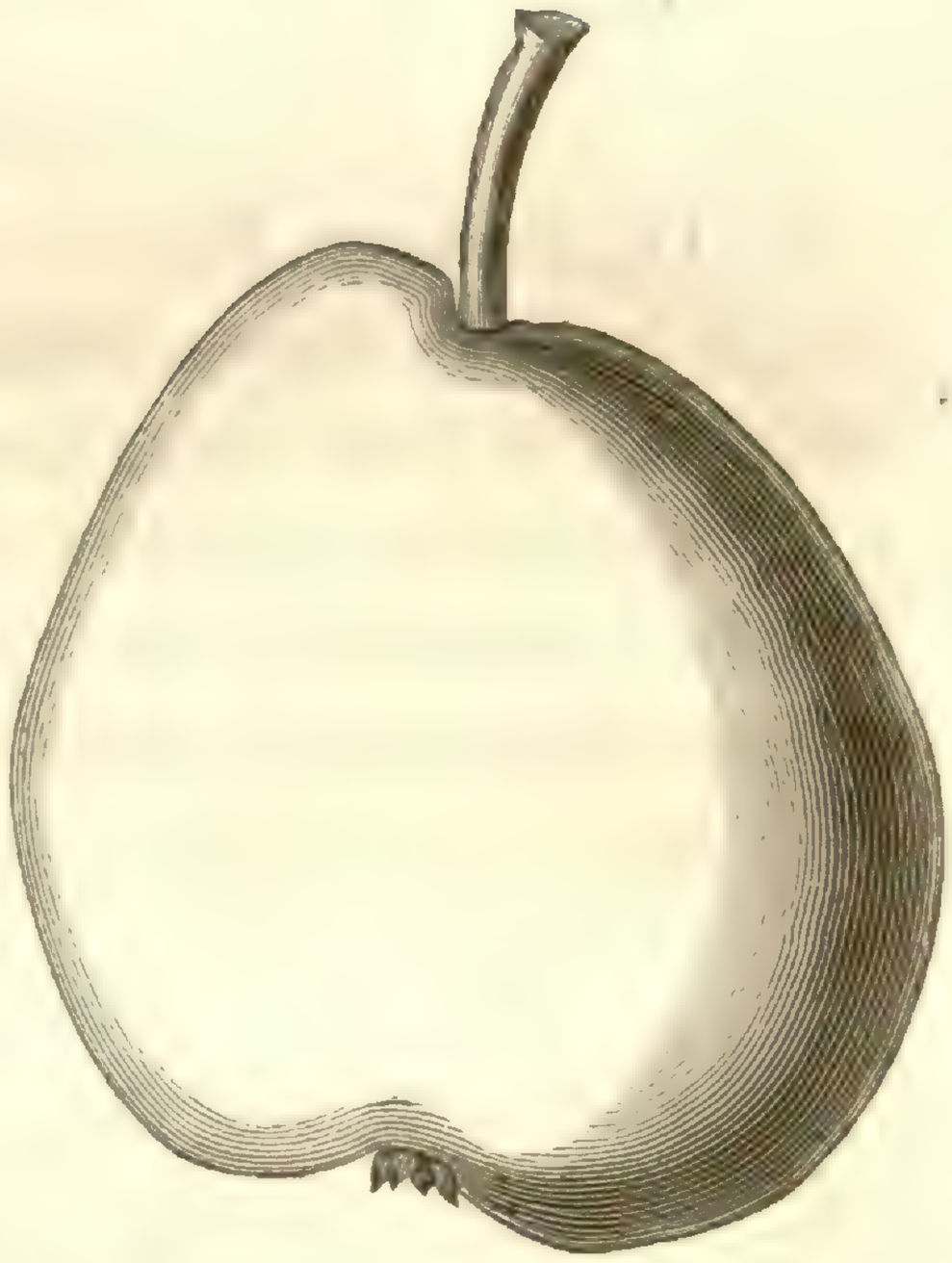
XIX. *Brigton Pear.* An immense bearer, one tree often yielding from thirty-five to forty bushels. Leaves large, ovate, pubescent; footstalks moderately long. Tree lofty; outer branches pendulous. Fruit ripe early in September; does not keep; eats moderately well; colour, dark grey.



XX. *Monie Penny* (Scoticè for many pence.) A great bearer. Leaves oblong, linear, smooth, serrated; footstalks rather short. Tree not lofty. Fruit ripe in October; an indifferently tasted Pear, but takes the market well; is scarce, and without much detriment to the interests of Pomona, may continue so; colour, dark green.



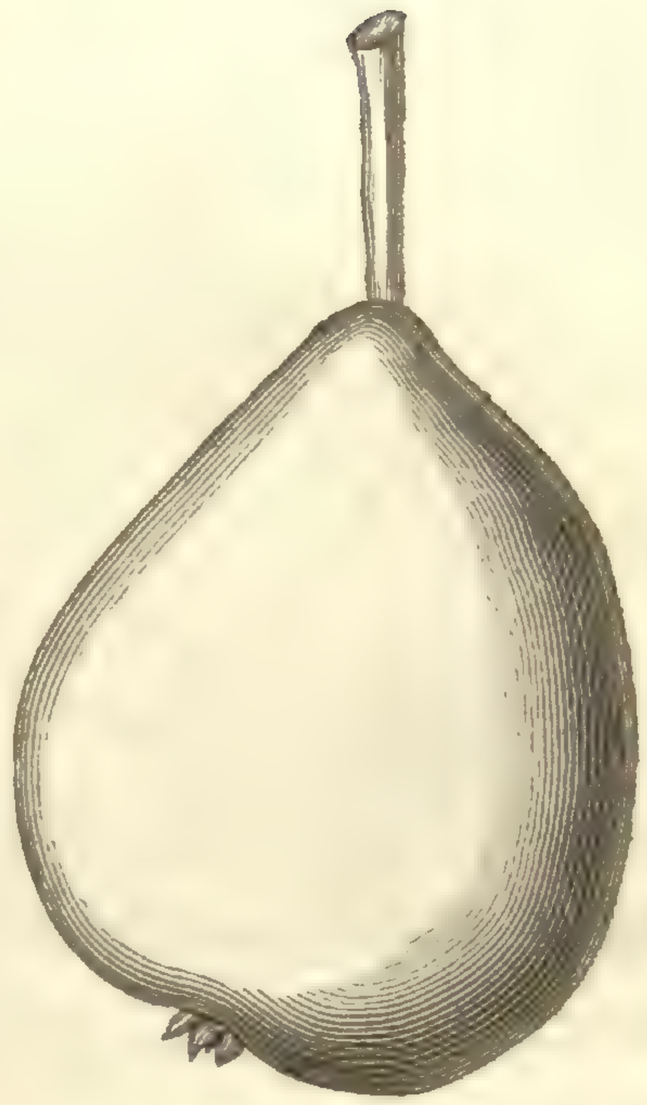
XXI. *Pippin Pear.* A large autumn Pear; a moderate bearer. Leaves narrow, acute; footstalks longish. Tree dwarfish, bushy. Fruit ripe in September; keeps three weeks; eats mealy; colour, reddish next the sun; green on the other side.



XXII. *Pear Nuttie.* Leaves small, roundish, slightly pubescent, not serrated. Tree dwarfish, a close bearer. Fruit ripe early in October; keeps a few weeks, taste indifferent; colour, light grey.

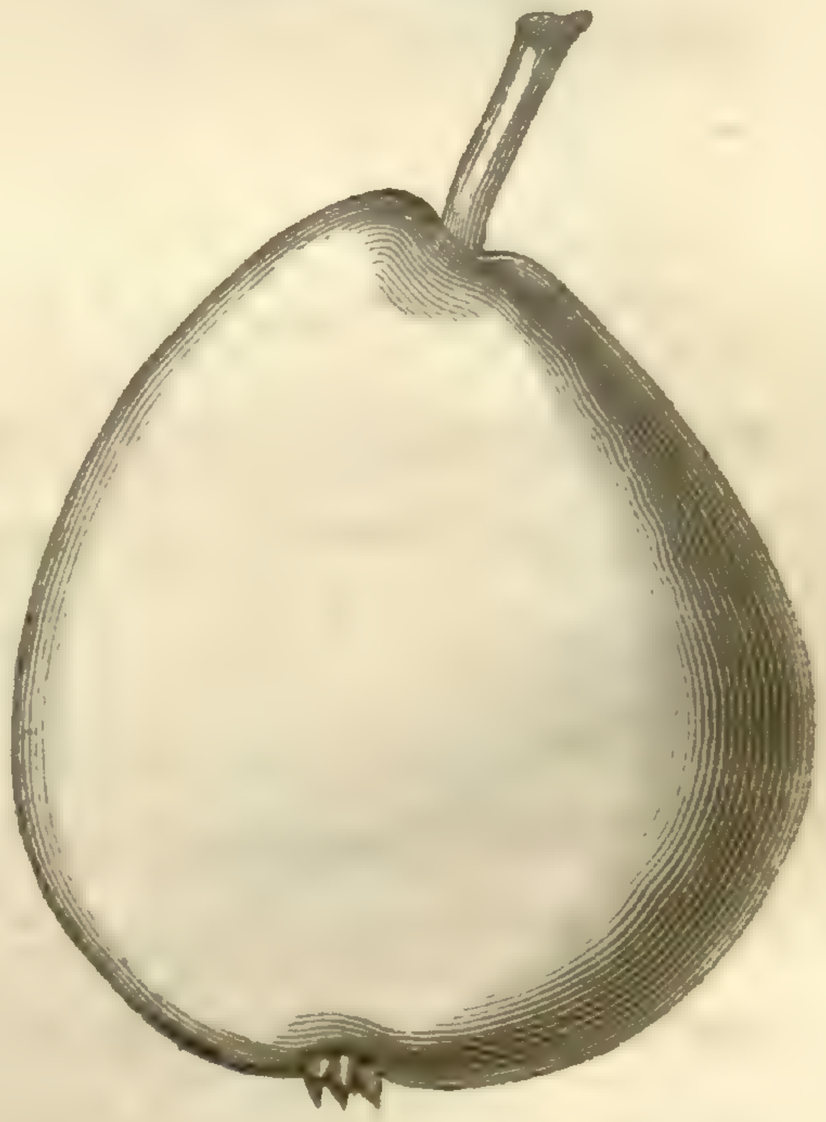
XXIII. *Crawford Pear.* A well known and extensively cultivated fruit. Leaves ovate, pubescent, not serrated; footstalks moderately long. Tree close, round-headed; a fair bearer. This and the two following are our earliest Pears. Ripe, often early in August; keeps about two weeks; a tolerably good table Pear; colour, dull white, when ripe.

XXIV. *Lammas Pear.* A very moderate bearer. Leaves long, lanceolate, smooth. Tree upright, very lofty. Fruit something like the Crawford, but fully sweeter; ripens a week earlier; keeps two weeks; cream colour.

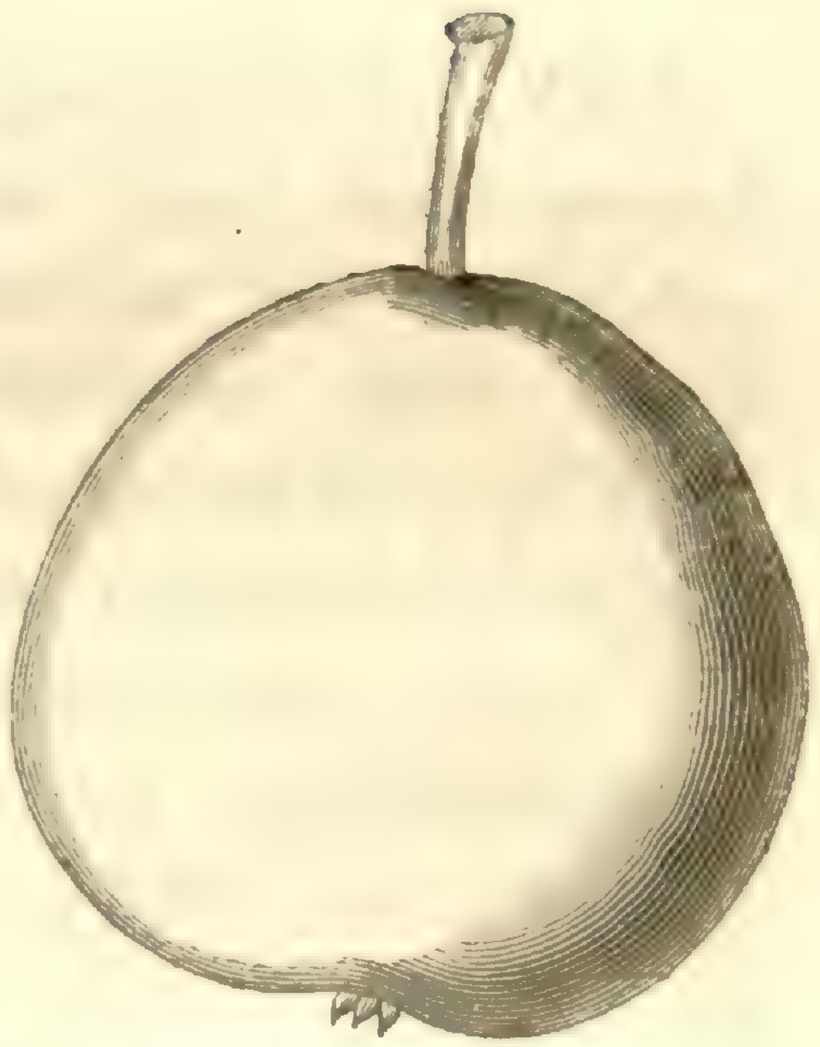


XXV. *Red Pear of Busie.* Leaves smooth, acutely pointed, serrated; footstalks long. Tree not lofty, round-headed. Fruit ripens early in August. A good table Pear; does not keep; colour beautiful, red next the sun, cream coloured on the other side.

XXVI. *Thrifty.* Leaves pubescent, not serrated, ovate; footstalks short. Tree not lofty, round-headed, bushy; a great bearer. Fruit ripe in the end of October; does not keep; sweetish; flesh tough; reddish next the sun, yellow on the other side.

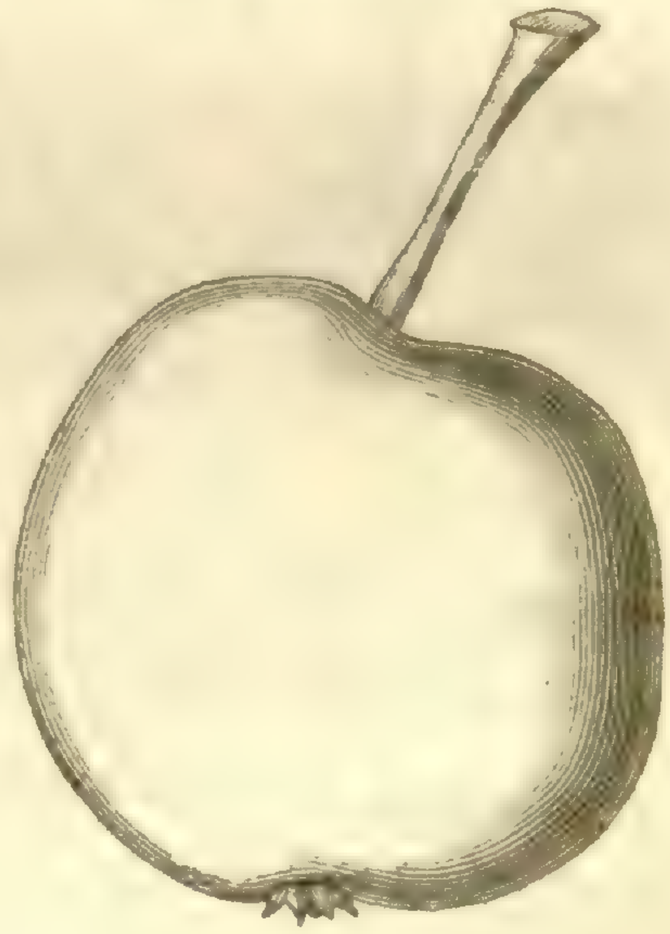


XXVII. *Monorgan Pheasant.* Leaves pubescent, not serrated, roundish; footstalks long. Tree very large, wood erect; a middling bearer. Fruit ripe by the end of October; keeps nearly a month; eats mealy, sweetish, not good; colour spotted, brownish-red next the sun; green on the other side.

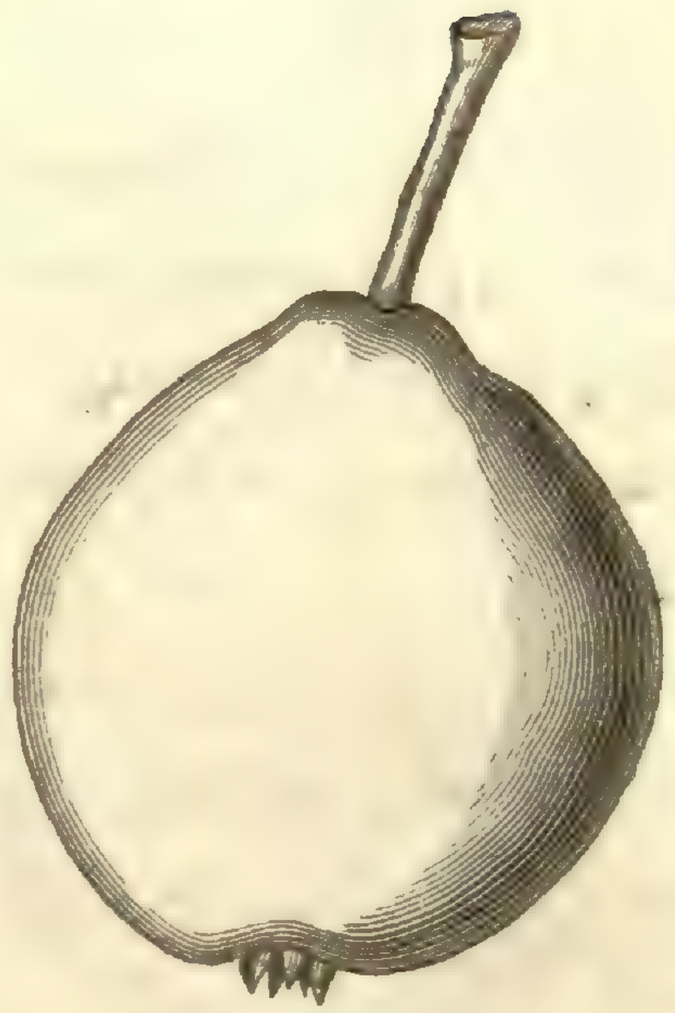


XXVIII. *Gold Knap of Powgavie.* Leaves small, pubescent, not serrated; footstalks short, slender. Fruit ripe late in October; keeps till December; juicy, middling sweet; spotted red next the sun, yellowish green on the other side. Tree lofty. Has little merit.

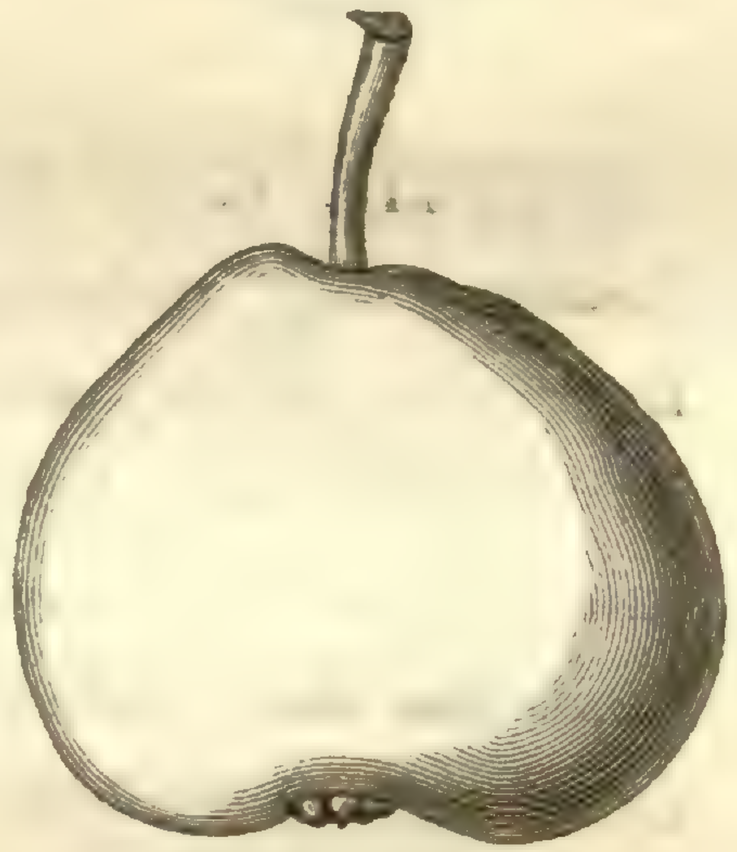
XXIX. *Gold Knap of Gourdie Hill.* Leaves small, obovate, slightly pubescent; footstalk short, slender. Tree round-headed, middle-sized. Fruit ripe in the middle of October; does not keep long; taste sweet and juicy; gold-coloured, smooth; a good dessert Pear, and a good bearer. Deserves attention.



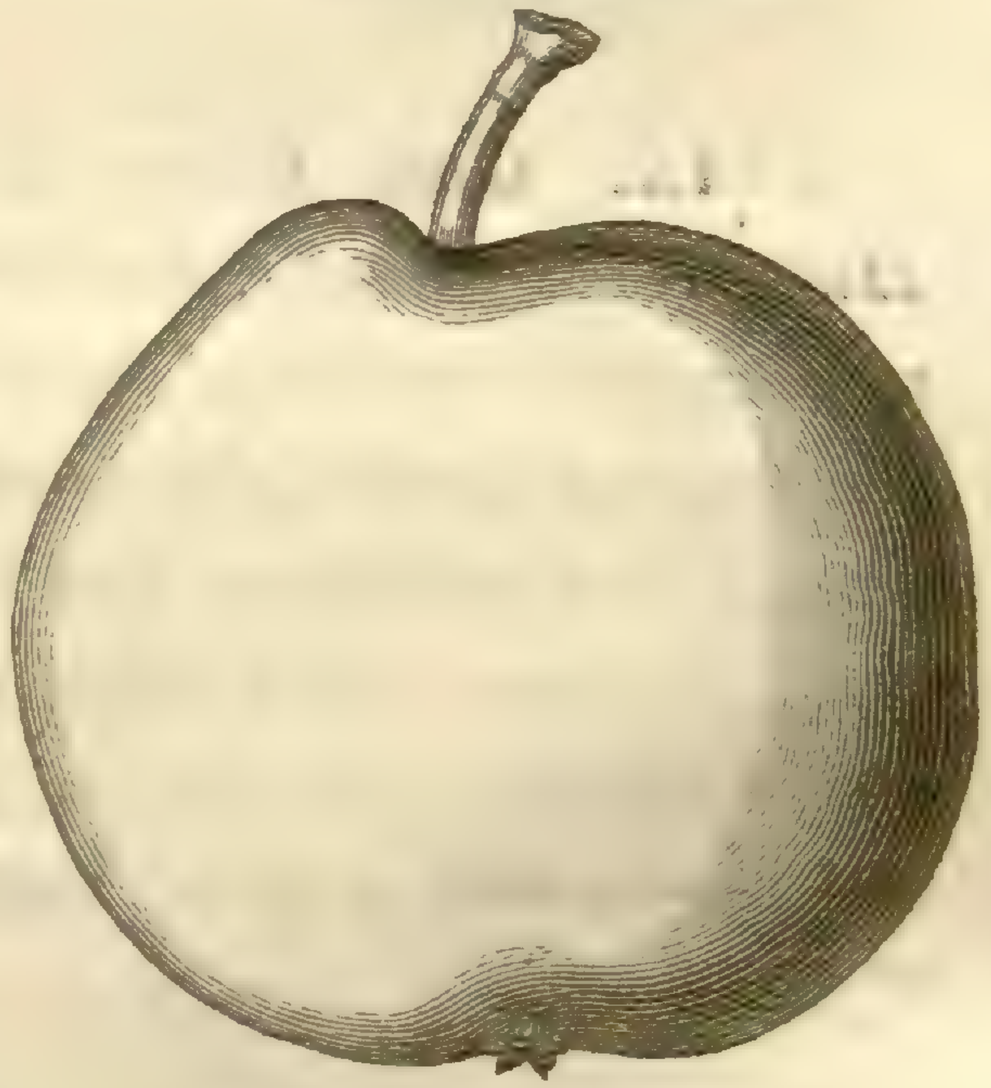
XXX. *Newbigging Gold Knap.* Leaves large, long, acutely pointed, pubescent, not serrated; footstalks long. Tree round-headed, middle-sized; a good bearer; fruit ripe in the middle of October; in season within two weeks after fruiting; taste very sweet and juicy; gold coloured. The best of all the Gold Knaps.

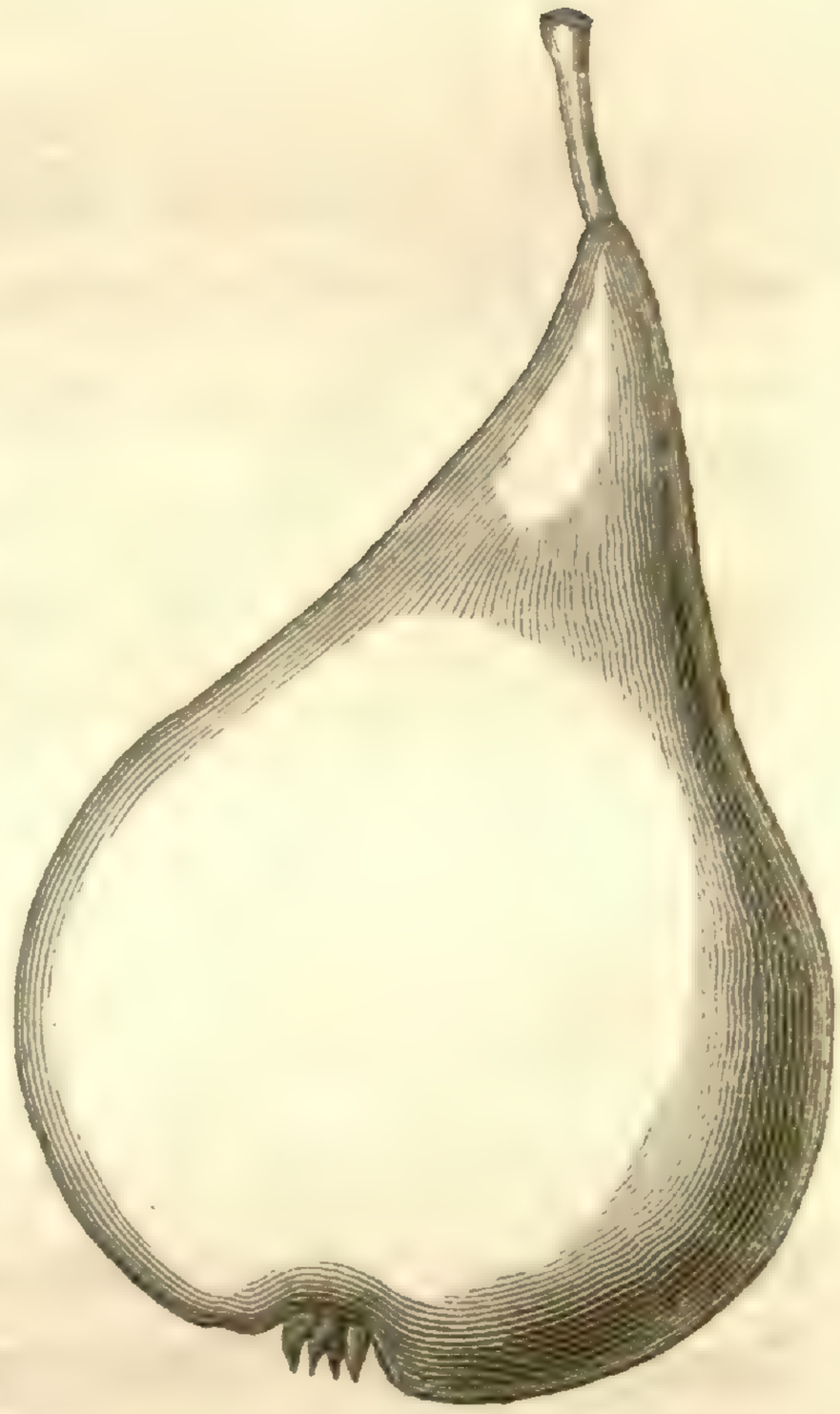


XXXI. *GoldKnap of Castle Huntley.* Leaves egg-shaped, smooth, slightly serrated; footstalks very long. Fruit ripe towards the end of October; does not keep above two or three weeks; gold colour. Tree very dwarfish.



XXXII. *Red Pear of the Leys.* Leaves small, roundish, smooth, slightly serrated; footstalk slender. Tree a full grower. Fruit ripe late in October. A shewy market Pear; it falls in baking, but is not fit for the table; colour red next the sun, green on the other side.

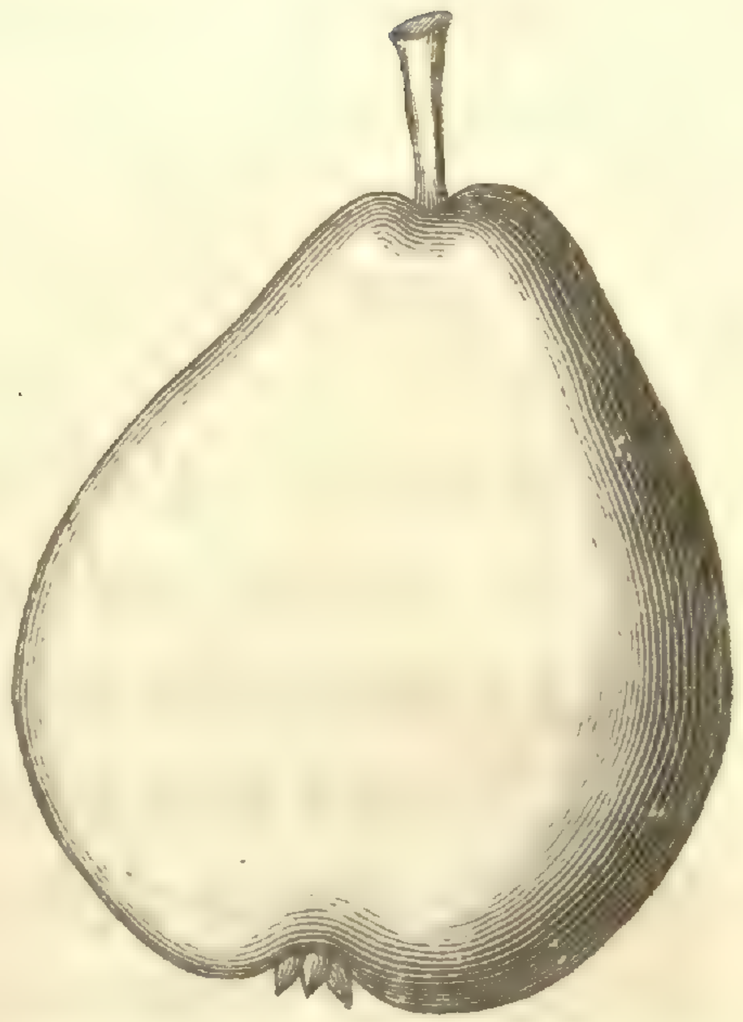




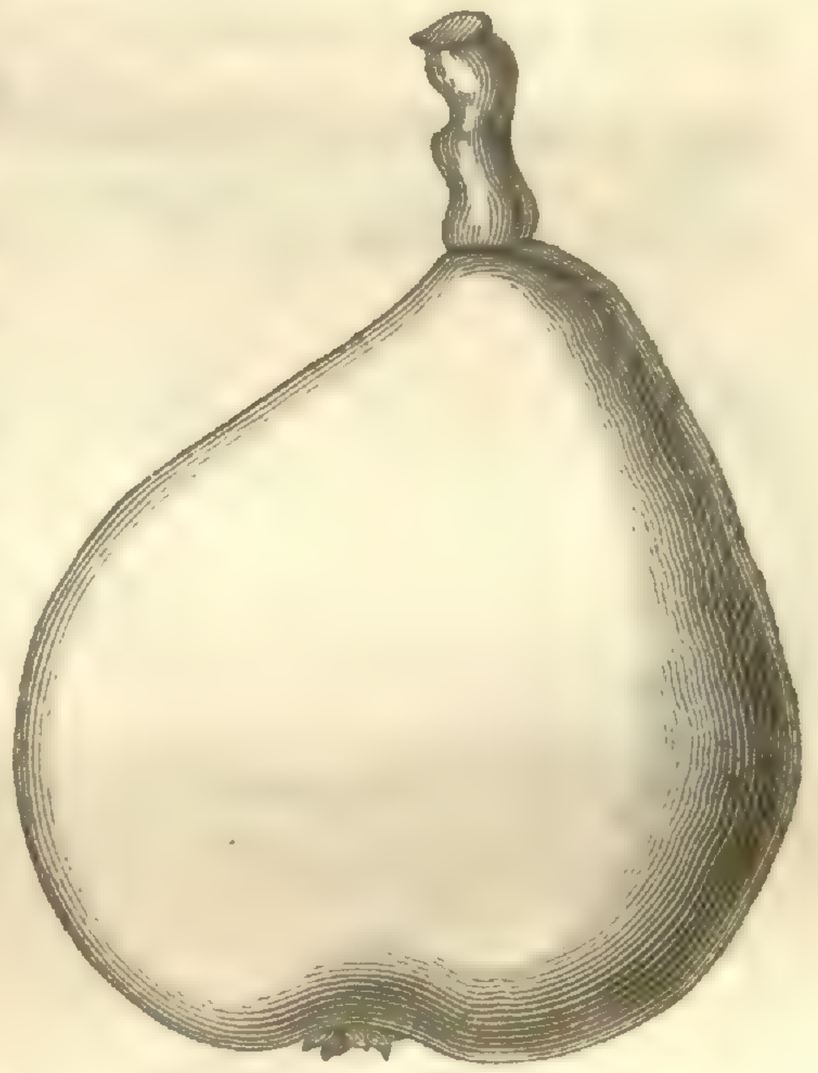
XXXIII. *Yellow Sugar-loaf.* Leaves round, pubescent, not serrated; footstalks rather short, slender. Tree a free grower, and great bearer. Fruit ripe in the middle of October. Sells well from its fine shape and beautiful yellow colour, but is useless in the kitchen, and can never appear at table.

XXXIV. *Golden Globe.* Leaves pubescent, round, not serrated. Tree middle-sized, round headed; a great bearer. Fruit ripe early in October; does not keep, eats mealy, but takes the market from its fine shape and beautiful gold colour.

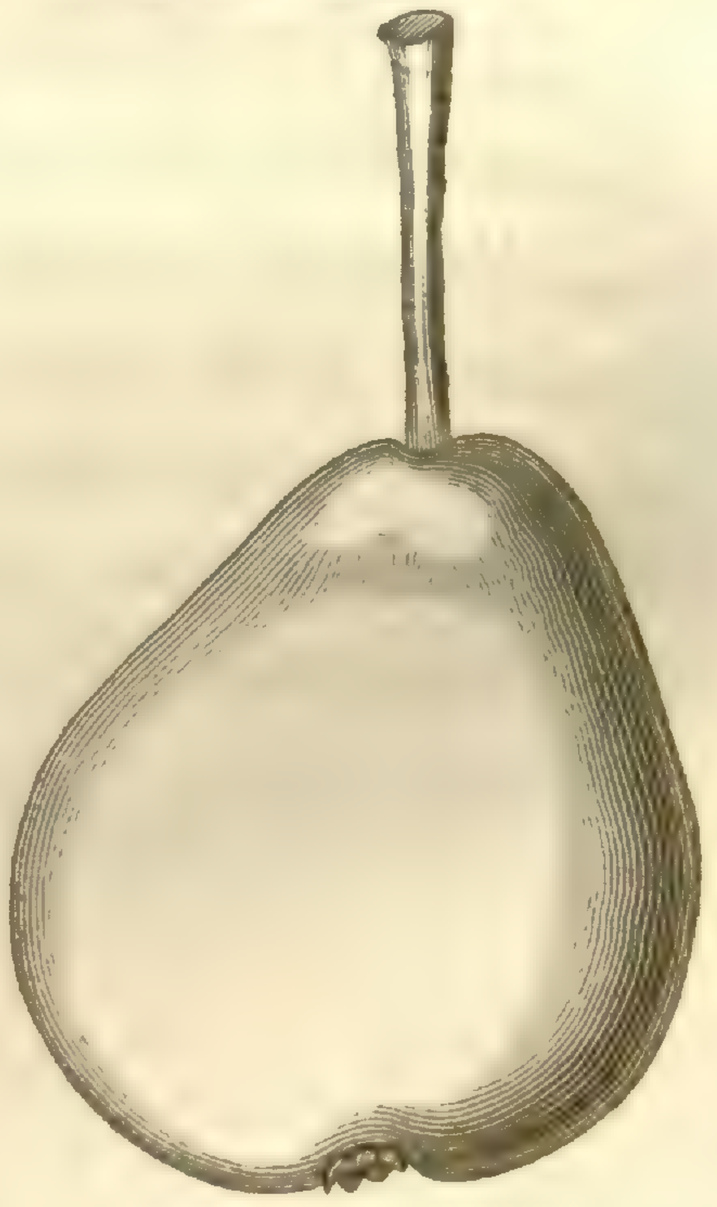
XXXV. *Beauty of Monorgan.* Has not a single quality except its beautiful shining vermilion and yellow colour to recommend it.



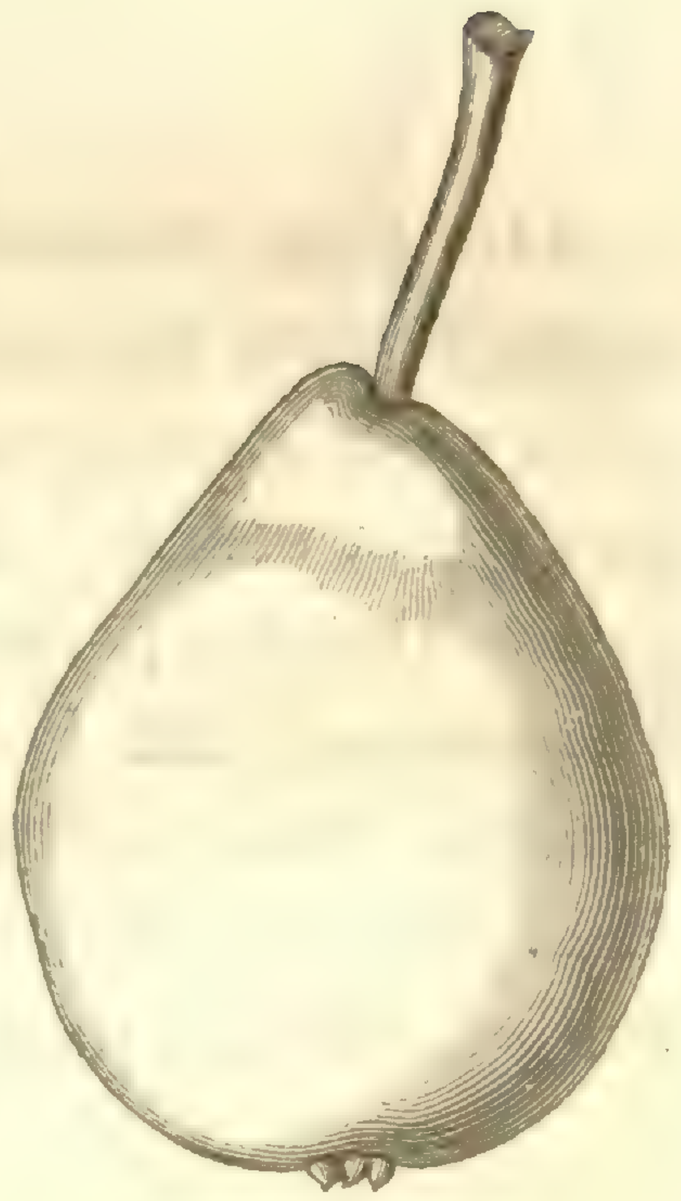
XXXVI. *Flower of Monorgan.* Leaves pubescent, not serrated; footstalks long. Tree old and broken down; scarce. Fruit ripe near the end of October. A good table Pear, does not keep long; shining red and yellow. Deserves attention.



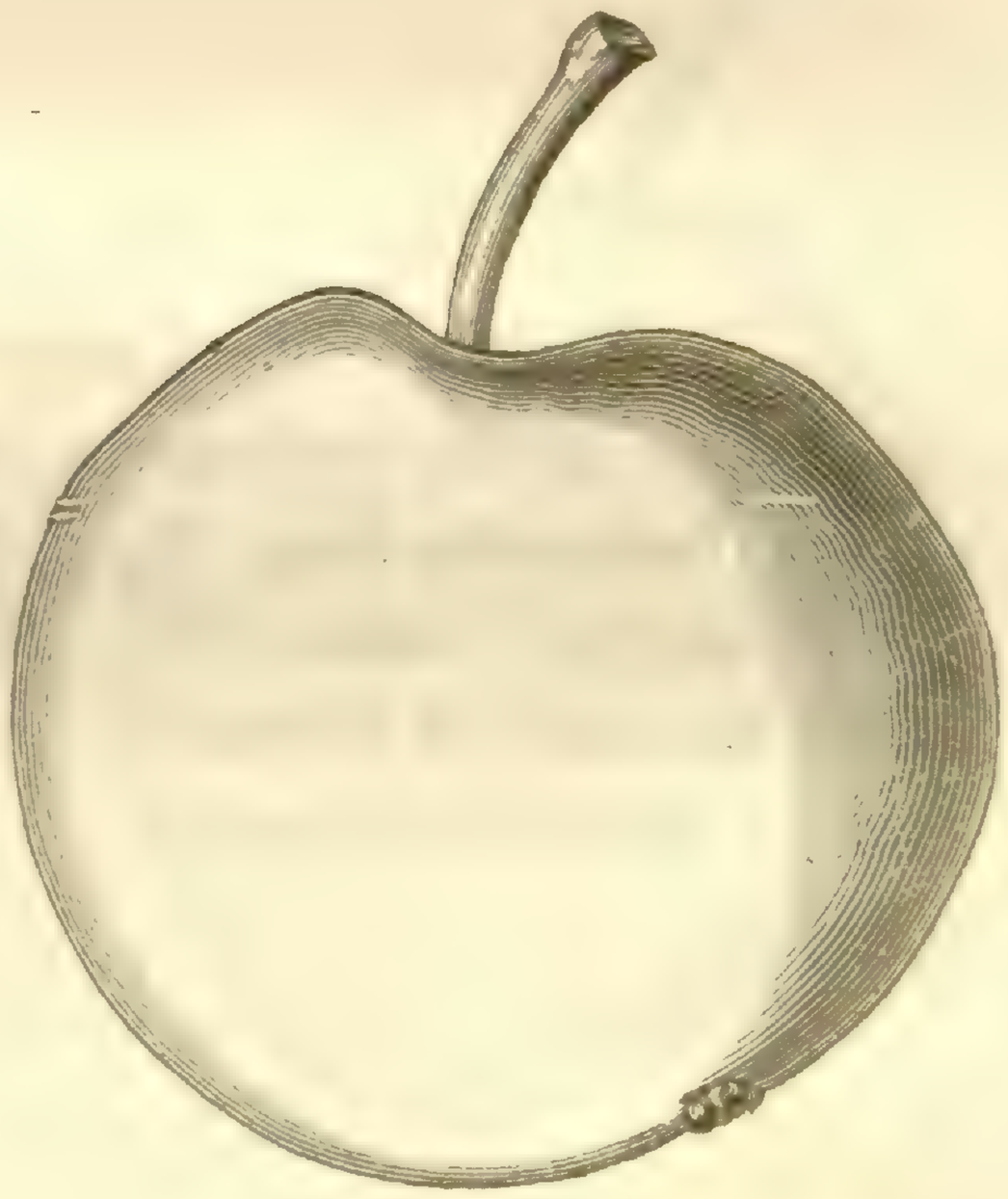
XXXVII. *Autumn Benvie.* Leaves slightly pubescent, and slightly serrated; footstalks long and slender. Tree lofty, round-headed; a middling bearer. Fruit ripe in the middle of October; does not keep; flesh soft, tough, and insipid; colour green, blotched with yellow. May be extirpated. Passes for the true Benvie.



XXXVIII. *Winter Benvie*. Leaves small, roundish, slightly pubescent; footstalks moderately long. Tree not lofty, round-headed. Fruit ripe towards the end of October; keeps a few weeks; reddish, spotted next the sun, greenish-yellow on the other side. Not a good Pear, but sells well. Passes for the true Benvie.

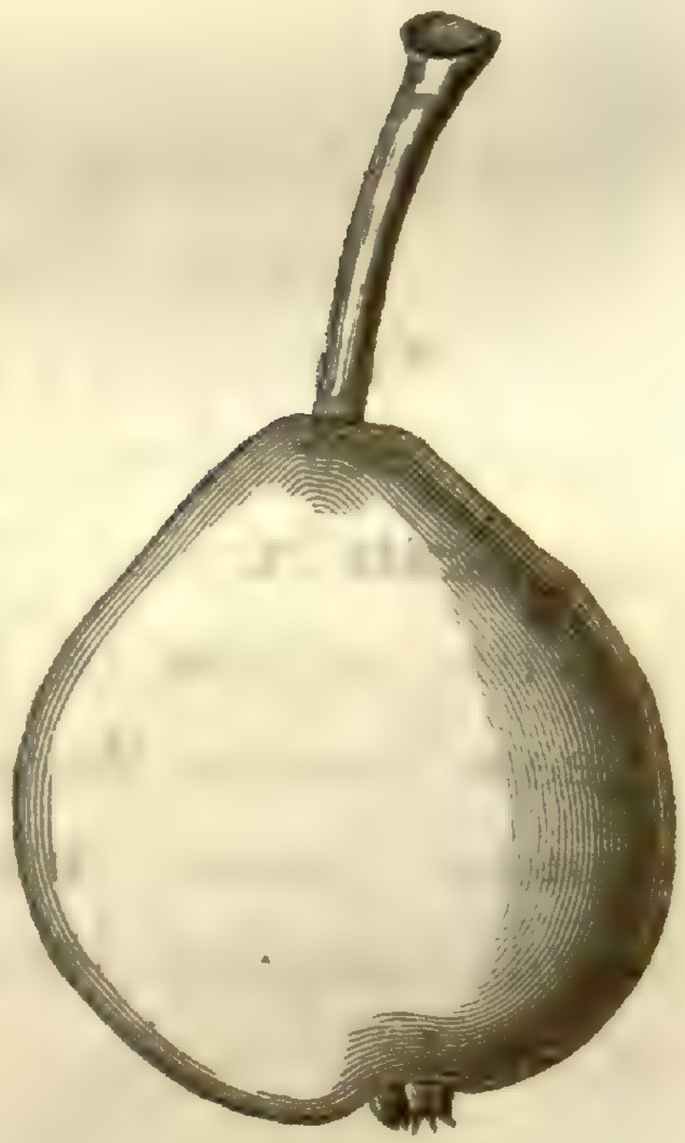


XXXIX. *Large Muirfowl Egg*. Leaves long, deeply serrated, smooth; footstalk short thick. Tree not lofty, a moderate bearer. Fruit ripe in the middle of October; keeps two to three weeks; colour green, with white spots. A good dessert Pear.

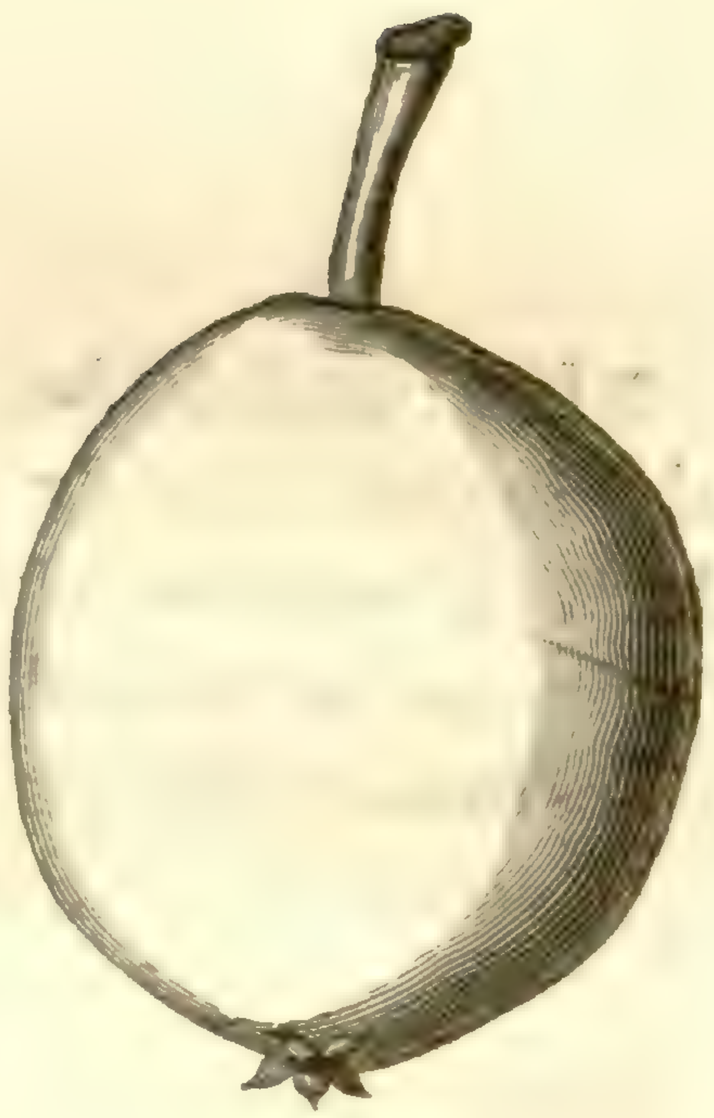


XL. *Pear Duncan.* Leaves longish, acute, slightly pubescent, not serrated. Tree a free grower, very healthy, and a very great bearer. Fruit ripe in the end of October; keeps till January, tastes sweet, falls in baking, but is not a table Pear; cream coloured when ripe. Deserves attention for its vigorous growth and its immense produce.

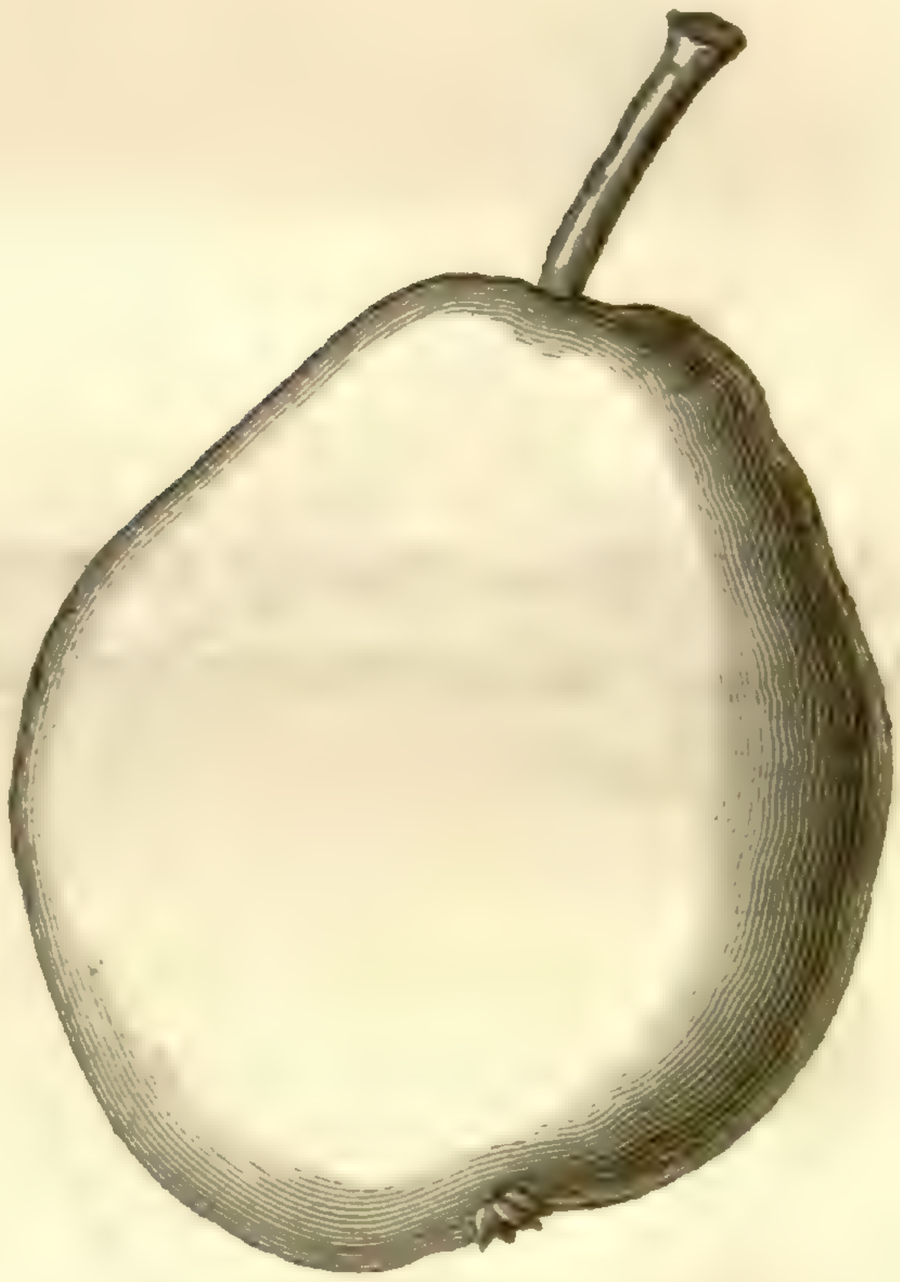
XLI. *Elcho Pear.* Leaves roundish, dark green, pubescent, not serrated; footstalks long. Tree very tall, spire-shaped; bears well. Fruit ripe near the end of October; sweet and juicy; colour light green.



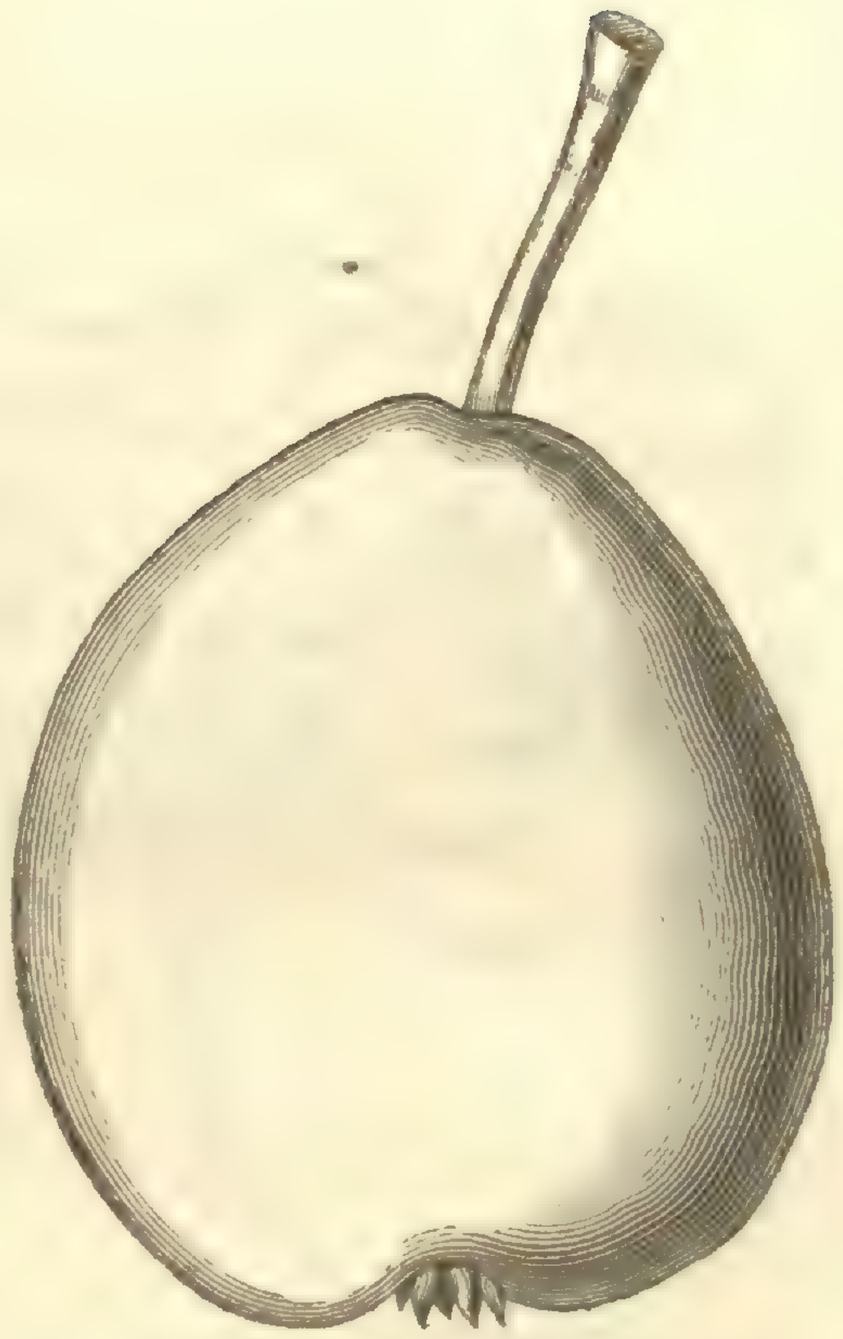
XLII. *Grey Achan.* Leaves egg-shaped, smooth, serrated. Tree conical, not lofty. Fruit ripe in the middle of October; keeps till near the end of November. A very sweet and juicy Pear; deserves attention; colour greyish green.



XLIII. *Pear Worry.* Leaves longish, narrow, smooth, serrated; footstalks long, slender. Tree a free grower. Falls in baking; colour brownish green. Indifferent.

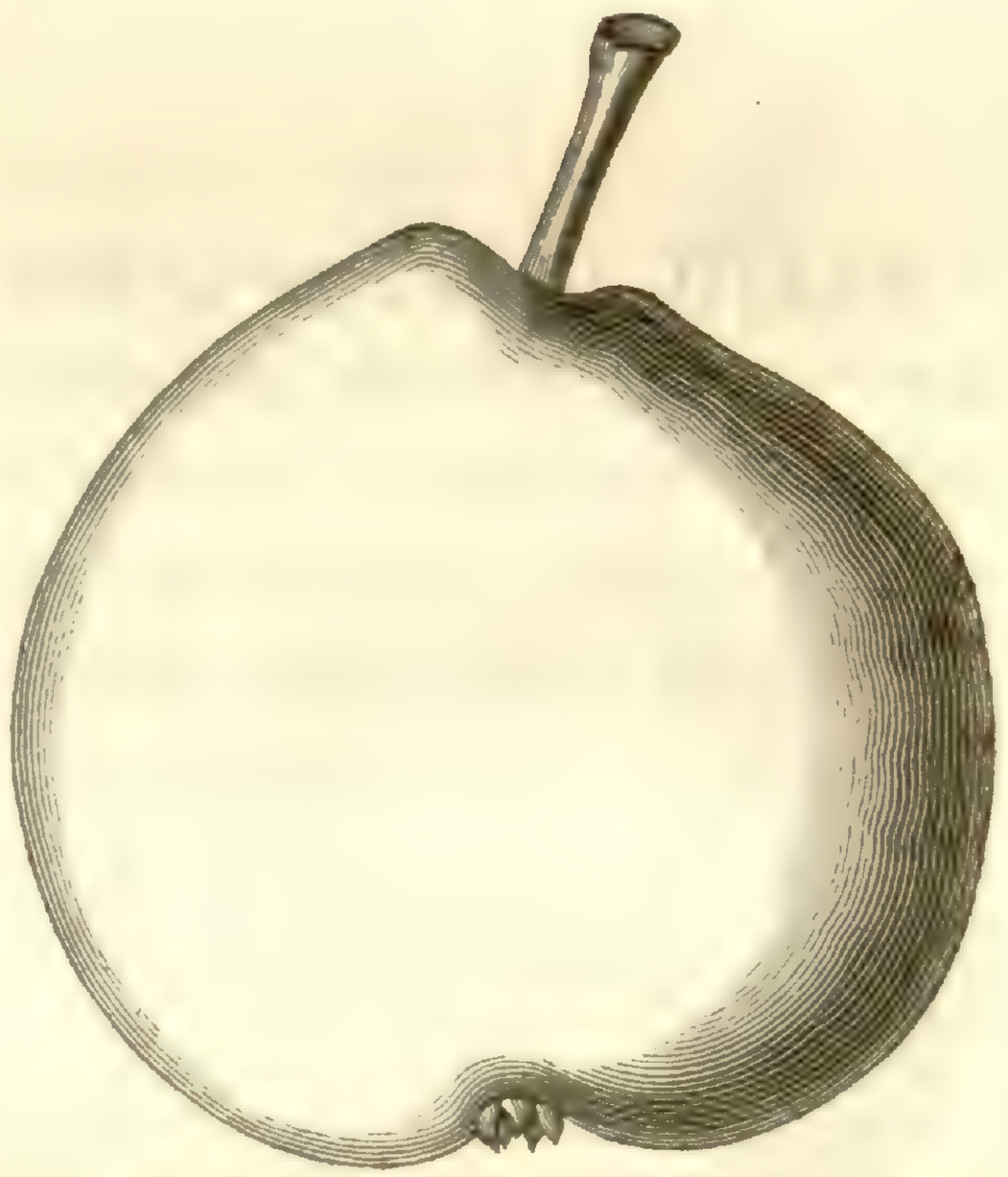


XLIV. *Rob Rhind.* Leaves roundish, smooth, slightly serrated. Tree dwarfish, branches close; bears well. Fruit ripe in the middle of October; keeps three weeks, eats mealy; colour light yellow.

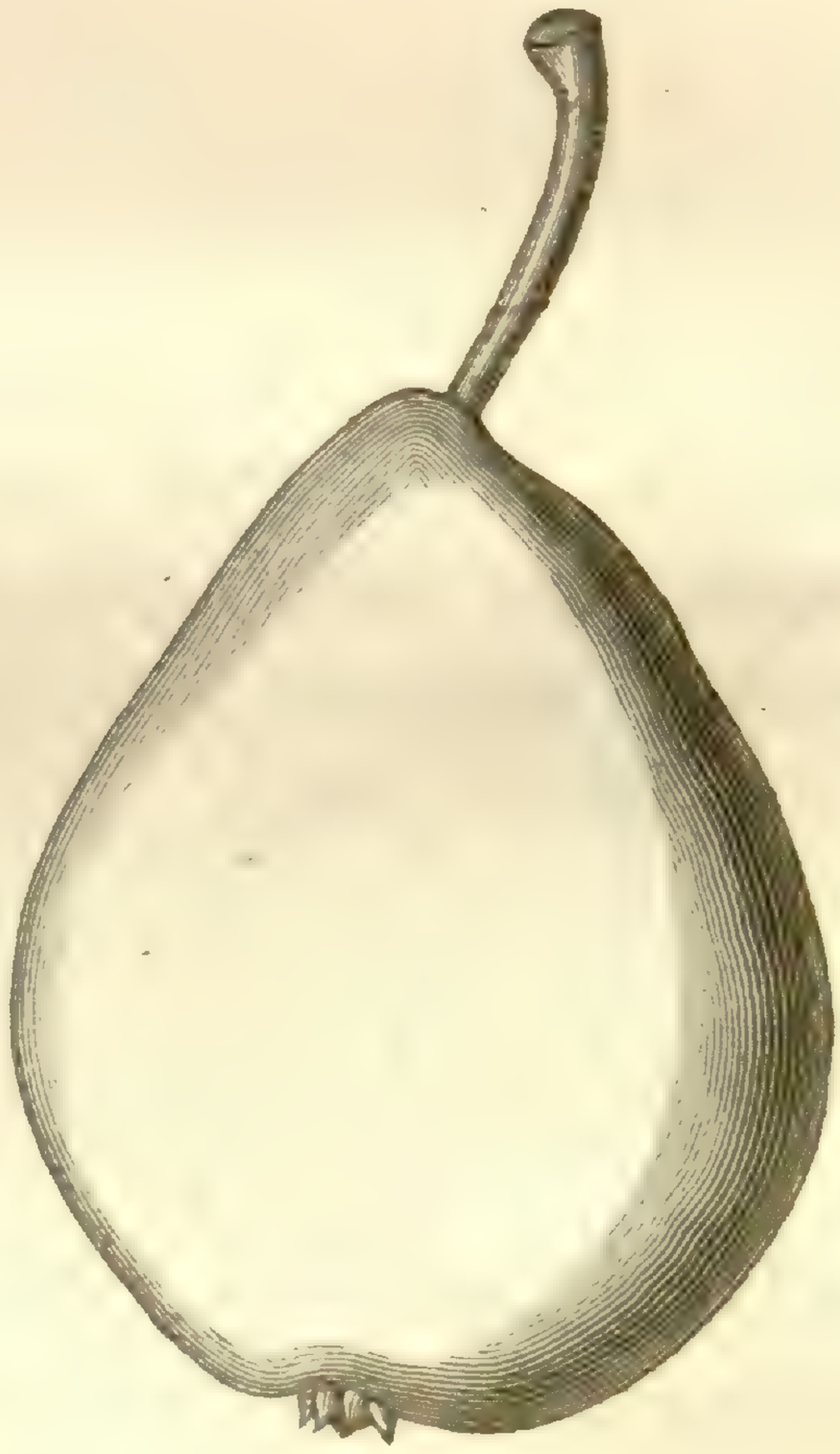


XLV. *Pear Diel of Gourdie Hill.* Not good for anything, and undeserving of notice.

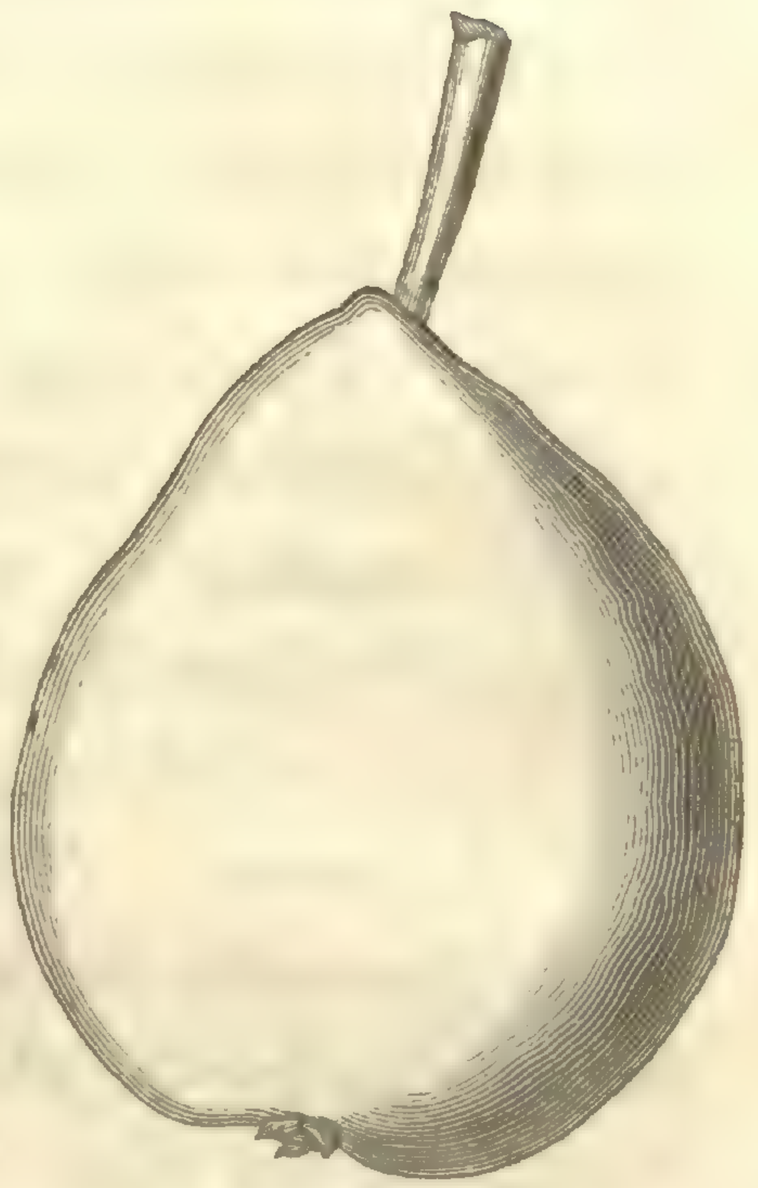
XLVI. *Pundie, or Pound Pear.* Leaves long, smooth, deeply serrated; footstalk long and thick. Tree open-headed, not lofty; a great bearer. Fruit ripe in the end of October; keeps about three weeks; a tolerably good table Pear, but does not fall freely in baking; colour greyish green. This is a great favourite in the Clydesdale orchards, where it is known by the name of Winter Bergamot.



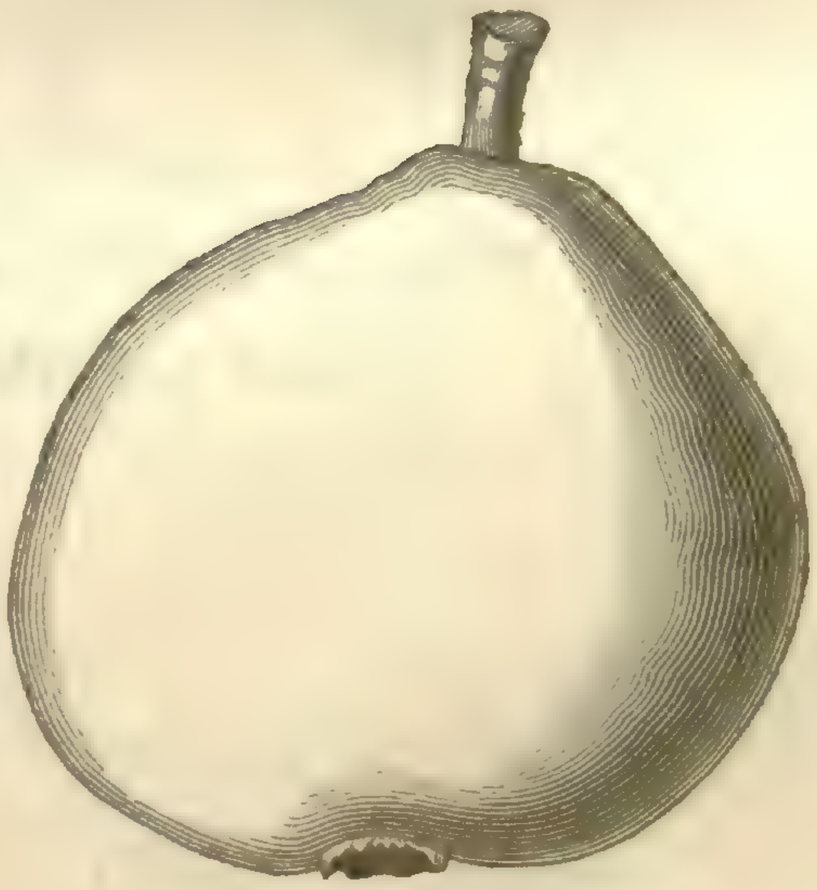
XLVII. *Green Cail Castock.* Does not fall freely in baking, and is of no other use.



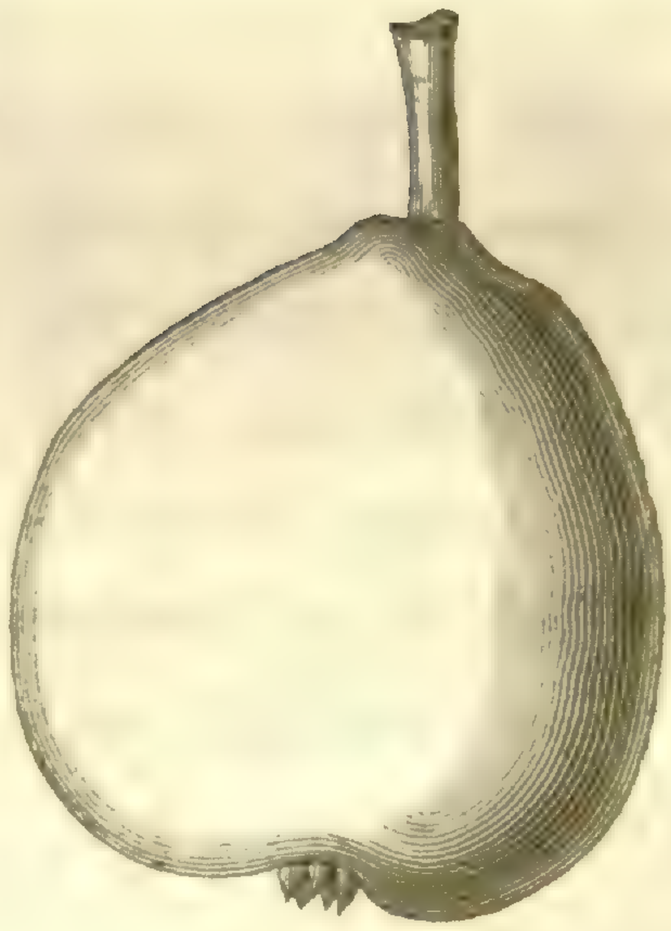
XLVIII. *Black Pear of Bog Mill.* Leaves long, smooth, serrated; footstalks long, slender. Tree very lofty, round-headed. Amongst our best orchard table Pears. Bears moderately. Ripe early in October; keeps till November; very scarce; colour dull black. Deserves cultivation.



XLIX. *Whorle Pear.* Leaves long, narrow, very slightly pubescent, not serrated; footstalks moderately long. Tree middle sized, round-headed. Fruit ripe in the middle of October; keeps a fortnight to three weeks; sweet, juicy, and well flavoured; a good Pear; colour next the sun yellow, freckled on the other side.

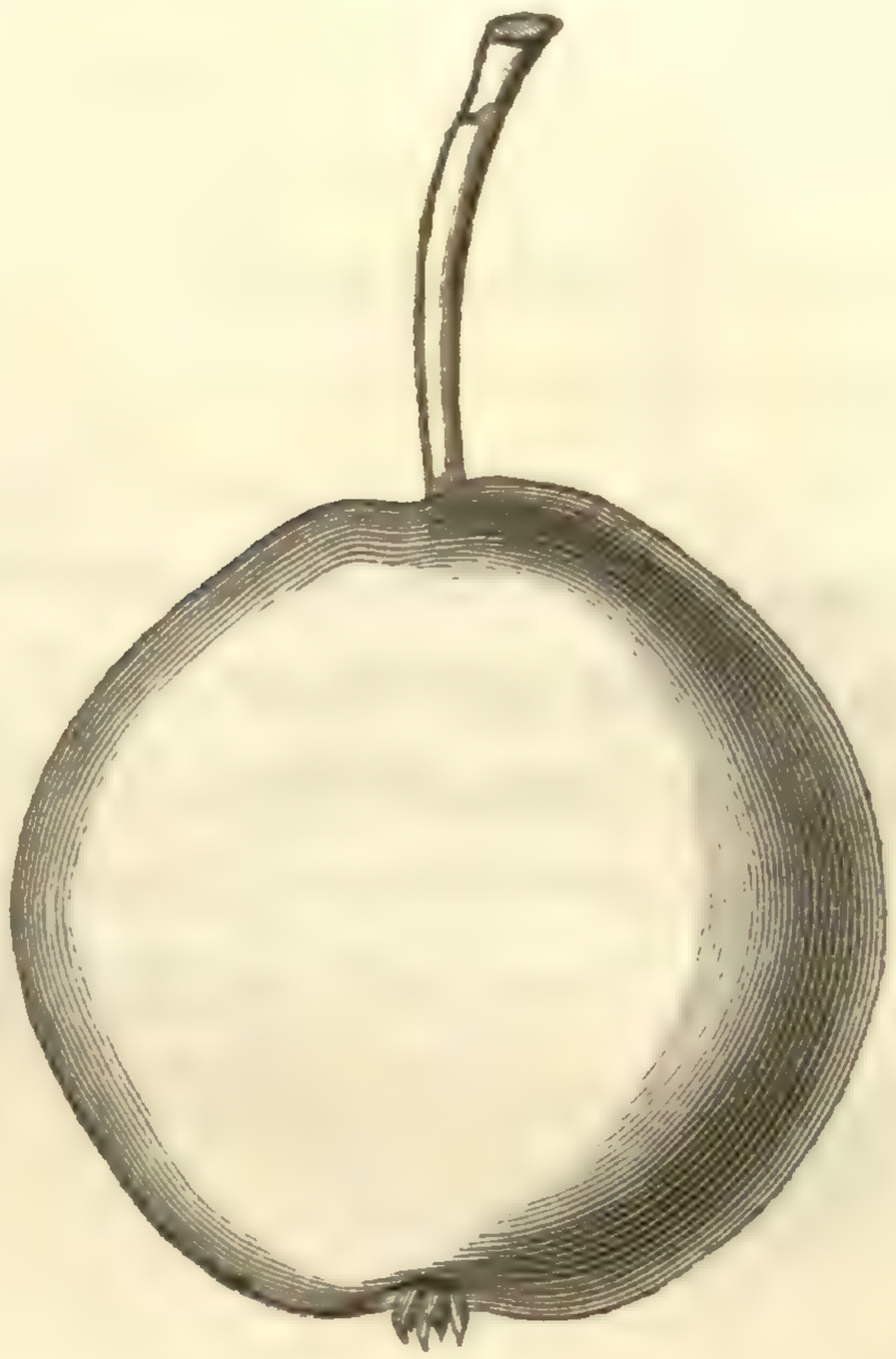


L. *Winter Ricket.* Leaves roundish, slightly pubescent, not serrated; footstalks long, slender. Tree dwarfish, branches pendulous. Fruit very indifferent; colour dull reddish grey.



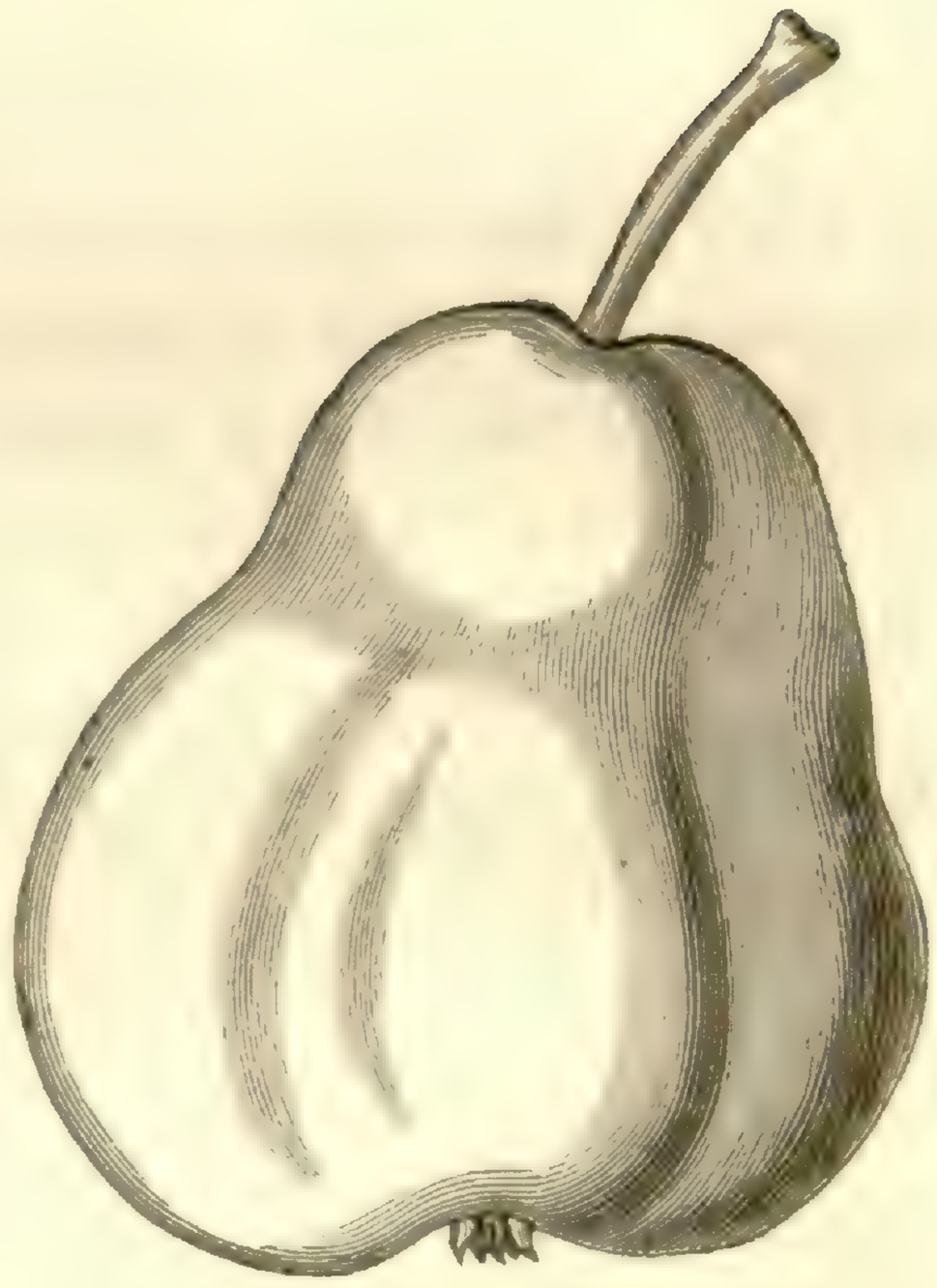
LI. *Red Swan Egg.* Leaves small, roundish, slightly pubescent; footstalks very long and slender. Tree lofty, erect. Fruit ripe in the middle of October; keeps three weeks or a month; taste moderately sweet; is a sure bearer; colour dark spotted.

LII. *Green Swan Egg.* I do not know that I am justisfied in attempting to pass this well known Pear as belonging to Scotland, I have only met with it in gardens; it is too well known to require description.

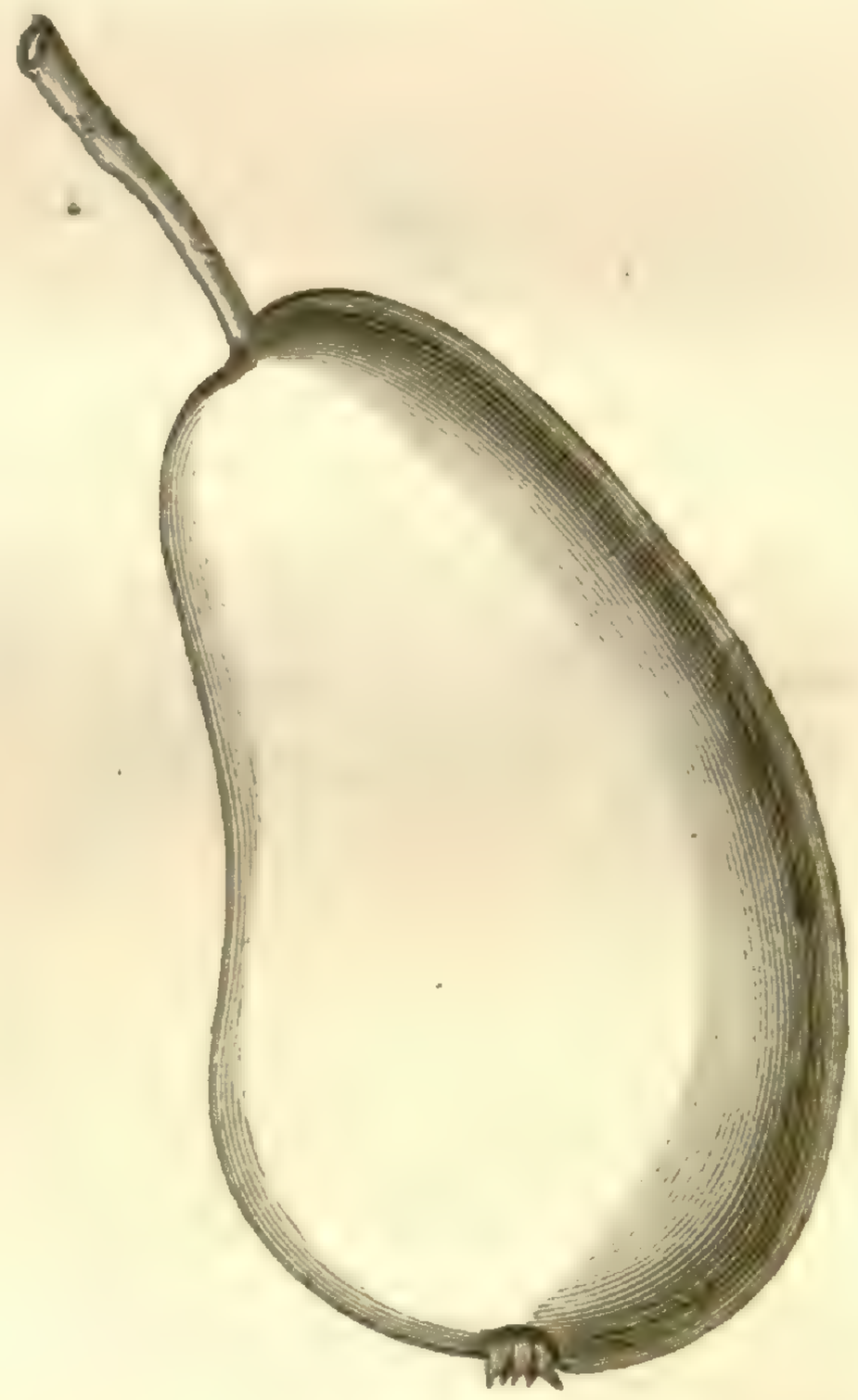


LIII. *Wall Pole.* A different Pear from Elshin Haft, No. 5, which bears this name also. Leaves large, smooth, not serrated; footstalks short, strong. Tree spire like. Fruit ripe late in October; keeps till January; useless as a kitchen or table Pear; beautiful yellow when ripe.

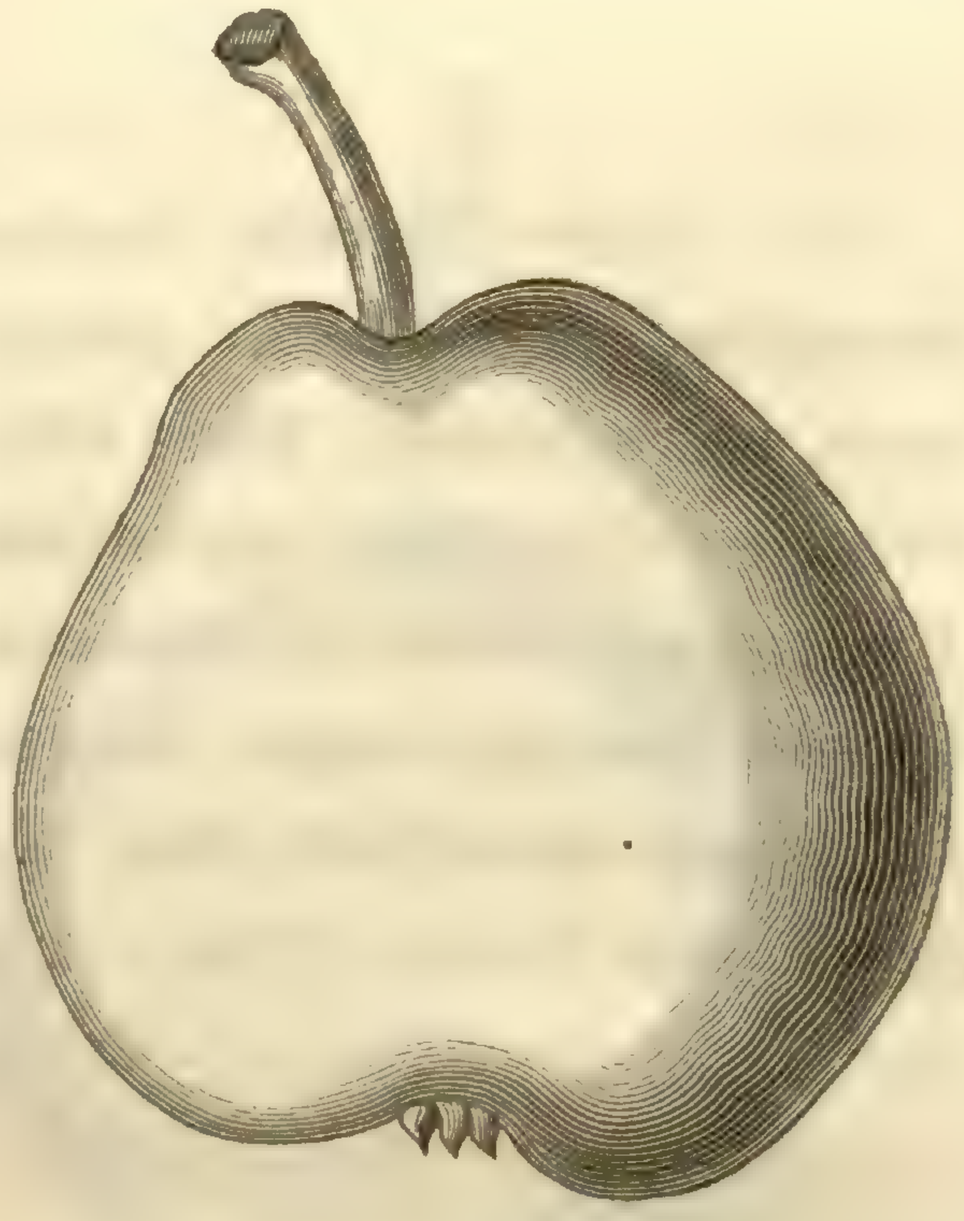
LIV. *Late Christie.* Leaves roundish, undulated, pubescent, not serrated. Tree lofty, branches straggling, pendulous. Fruit ripe middle of October; keeps two to three weeks; taste not excellent, but is a good large baking Pear; falls freely.



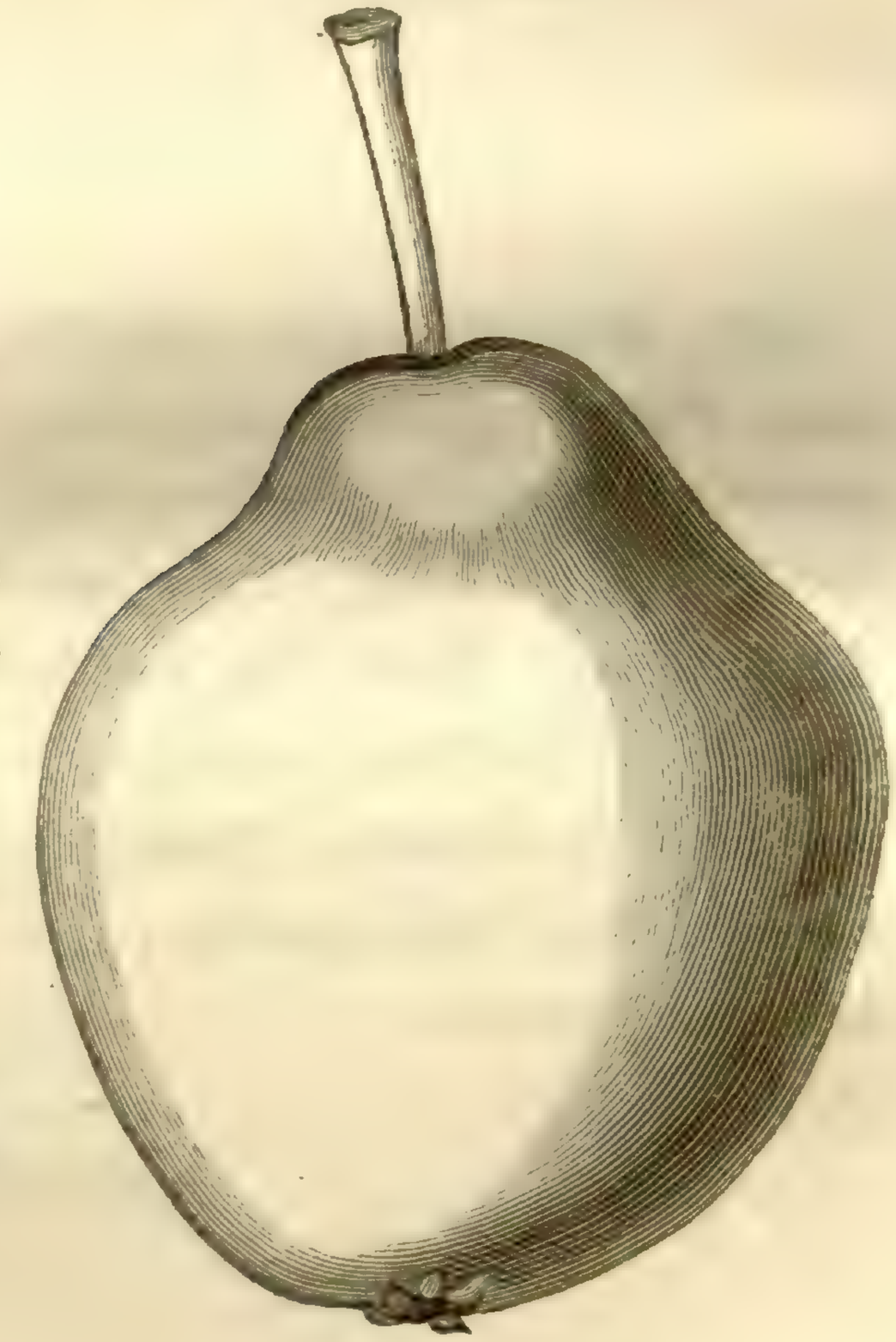
LV. *Kilwinning, or Clydesdale Pear.* Leaves roundish, smooth, not serrated when old; footstalks not long. Tree moderate size. Fruit ripe in October; keeps three weeks to a month. A dessert Pear, but not of the first quality; colour dark green.



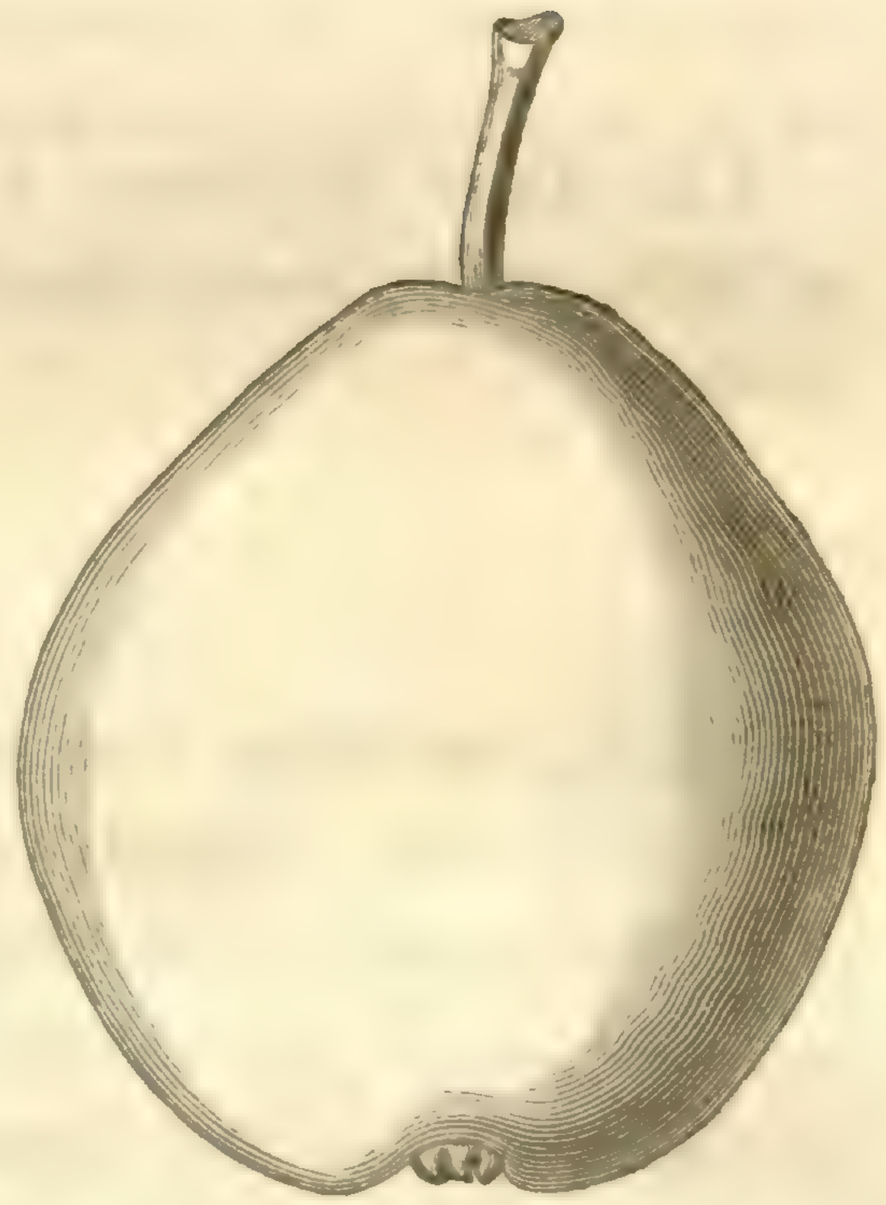
LVI. *Black Bess of Castle Menzies.* I think a healthy variety of the Black Achan, wrought on a Pear tree which bore roundish fruit, as the shape of the fruit of the Stock has often a slight effect in assimilating the fruit of the tree it supports to its own, in shape.



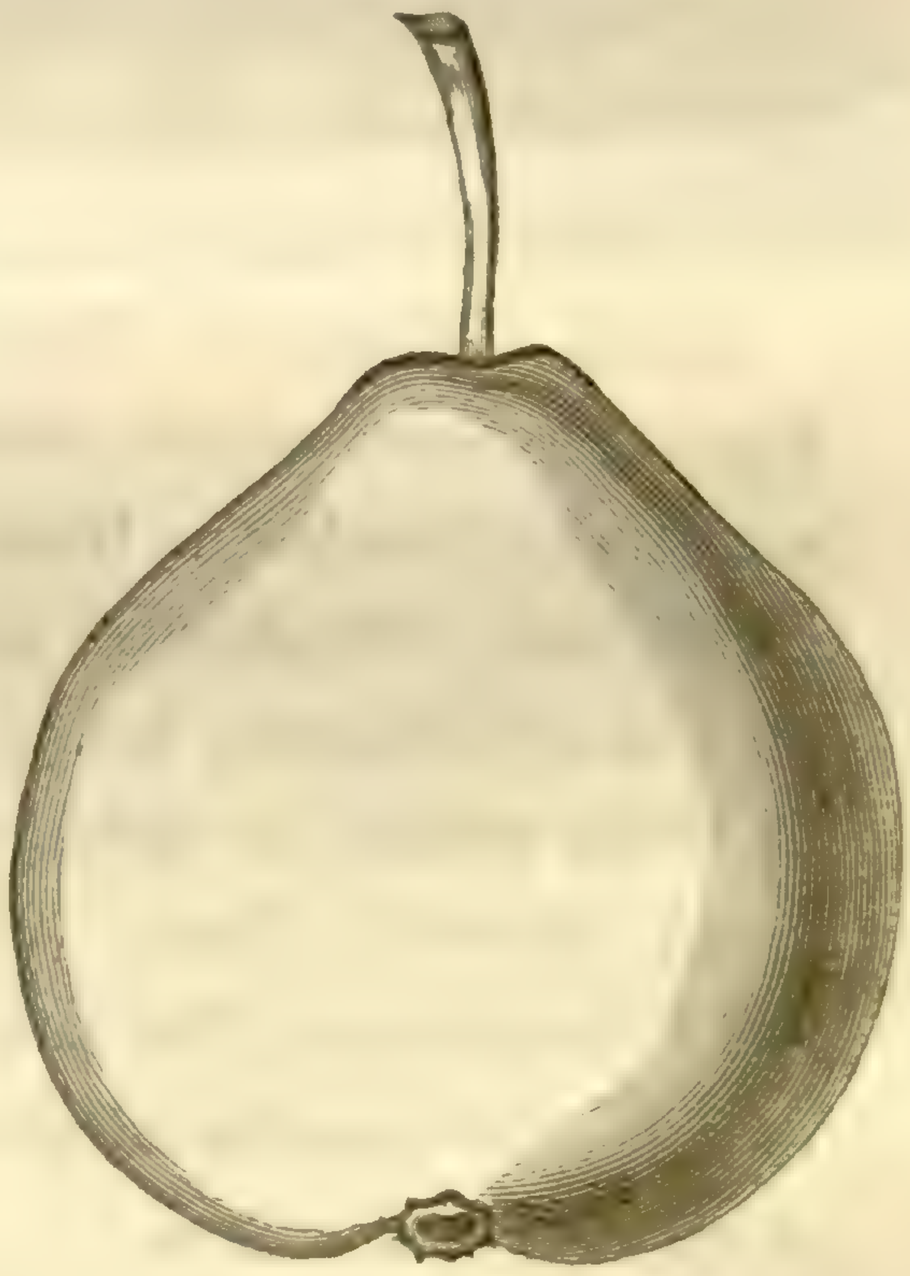
LVII. *Black Achan.* This well known and excellent Pear requires no description.



LVIII. *Green Achan.* Leaves ovate, undulated, slightly pubescent, not serrated; footstalk moderately long. Tree a free grower, branches pendulous, and often broken with the weight of fruit if unsupported. Fruit ripe in the middle of October; keeps a month. It can hardly be called a dessert Pear, but deserves a place in the orchard.

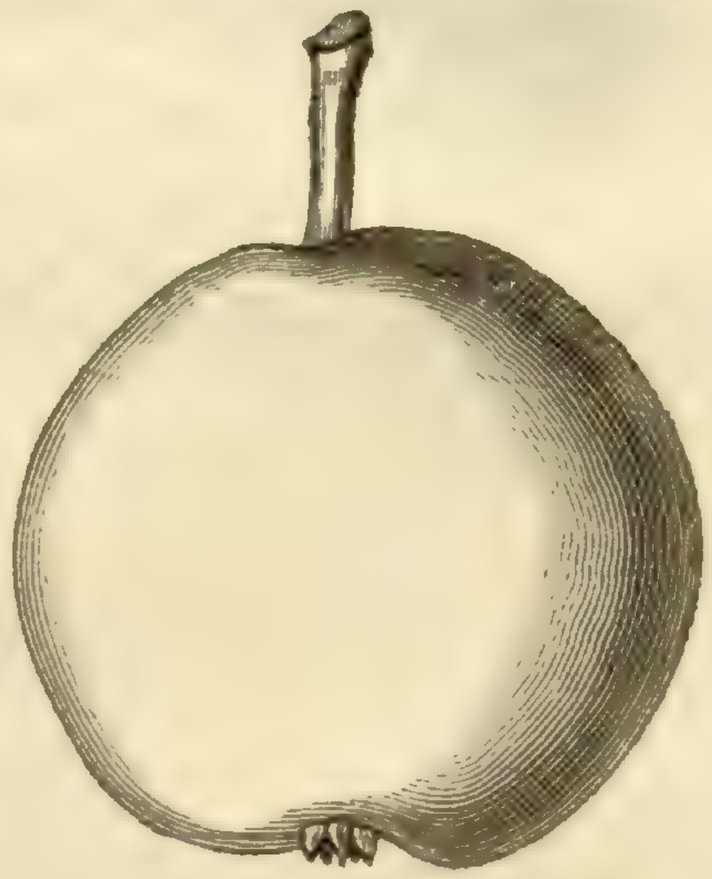


LXIX. *Pear Grannie, or Green Pear of Hill.* Leaves ovate, smooth, deeply serrated; footstalks straight. Tree moderate size. Fruit ripe end of October; keeps two to three weeks; taste sweet and juicy, not excellent, but a sure bearer; colour of this and the Green Achan green, as their names import.

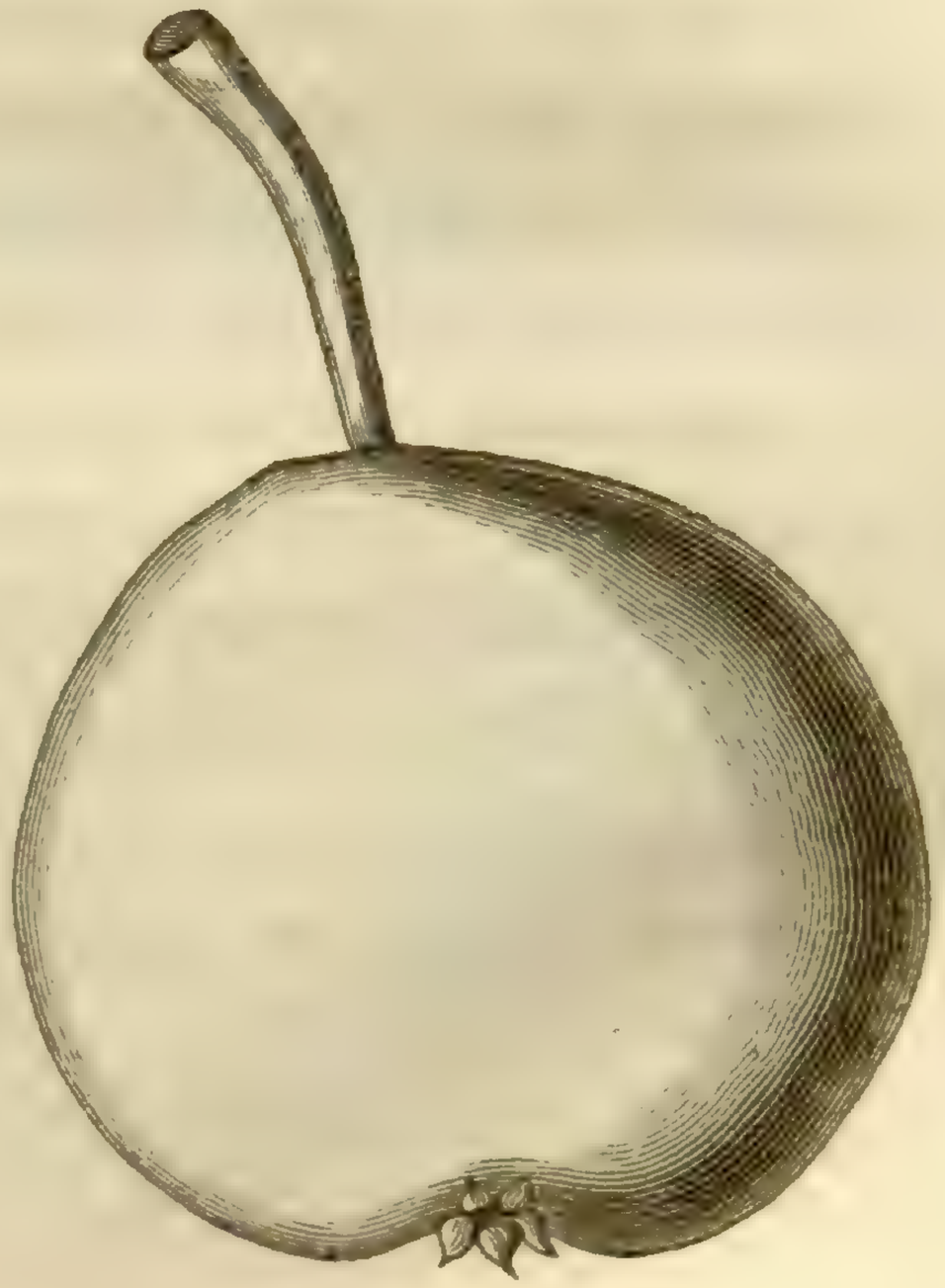


LX. *Pear Mackray.* A seedling of little merit; scarce deserving any notice.

LXI. *Pow Meg.* Leaves oblong, smooth, very slightly serrated; footstalk short. Tree lofty, an immense bearer. Fruit ripe end of October; keeps till January. A moderately good dessert Pear; taste slightly mealy when too long kept; colour vermilion, finely spotted next the sun; yellow on the other side.



LXII. *Galston Muirfowl Egg.* Leaves roundish, smooth, serrated. Tree lofty; branches pendulous. Fruit ripe in the middle of October; keeps two to three weeks; a moderately good dessert Pear; colour light brown next the sun, yellowish green on the other side. A west country Pear.



From the above descriptions it will appear that the varieties that come for use in November are too numerous, while the supply for the winter and spring months is by far too limited in our orchards.

1. 2. 3. 4. 5.

1. Early, or Yellow Benvie.
2. Pow Meg.
3. Elcho.
4. Busked Lady.
5. Genuine Gold Knap.

XXXVIII. *An Account of some Varieties of the Apple which have been found to succeed in a Garden in Rosshire, Latitude 57° 34′ 54″, N. with Descriptions of Five New Seedling Apples. In a Letter to the Secretary. By Sir* George Steuart Mackenzie, *Bart. F. H. S.*

Read March 20, 1827.

My Dear Sir,

As you expressed a wish to know which of the many varieties of the Apple I had tried, had succeeded in this quarter, I now comply with it, and should have done so sooner, had I not been anxious to ascertain the length of time some of the fruit would keep, after having been brought to a more perfect state of maturity than usual, by the long duration and intensity of last Summer's heat. I may premise that there are many climates in this county varied by proximity to the sea, elevations above it, and subsoil. Along the shores of the Friths the bottom is either gravel or sand, and gardens placed over these are much earlier than mine, which has the disadvantage of being on a cold stiff tilly clay, very retentive and poor, and in being high and exposed, though surrounded with wood of tolerable growth. I consider all the disadvantages I have to contend with rather fortunate than otherwise for experiments, because whatever may succeed with me is sure to answer well in more favourable situations.

1. Herefordshire Pearmain. Trained on an espalier, has

generally ripened well, was eaten in perfection in February, when it acquired a greenish yellow colour on one side, and a russet red on the other. I consider this as a very fine fruit, and valuable on account of its keeping well. It continues good till the middle of March, and then loses much of its flavour.

2. Kirke's Golden Reinette. Trained on an espalier, is in shape like the preceding, but acquires at an earlier period a bright reddish yellow. It is a very beautiful Apple, but does not equal the preceding in flavour. It keeps as long, but is best in January.

3. Wormsley Pippin. Trained as above, has proved hardy, and attains a very large size. It is a pleasant fruit and useful in the kitchen during its season, which is November and December.

4. Kerry Pippin. This is also hardy, it is a pretty fruit, and an excellent table Apple during its short season. It scarcely retains its flavour till December,

5. Devonshire Quarenden. Whether it be owing to the soil or climate, the Apple I have under this name, and which by sending specimens to the Society has been determined to be the true variety, has seldom exhibited the flat shape of the Apple as delineated by Hooker.* It has ripened perfectly every year since the tree began to bear, but has never had the peculiarly fine flavour of those I have tasted from the south.

6. Northern Greening. This is a very useful kitchen Apple, keeping well till the season for Rhubarb.

7. Norfolk Colman. This is of the same character, and

* Pomona Londinensis, No. 13.

keeps much longer. I have had it sound, but destitute of all taste and flavour, in August. Its season ends in April.

8. The Brown Apple of Burnt Island. I find from the printed Catalogue of the Society's fruits that this is the same as the Aromatic Russet, and synonymous to the Spice Apple, which is considered its proper name. It is an ugly fruit, but when fully ripe of a rich flavour. It is an excellent Autumn Apple, and in season for about fortnight or three weeks at that period.

9. Peach Apple. Is very early, of a high and peculiar flavour, relished by some persons and disliked by others. It soon decays after being removed from the tree. I have it on a standard.

10. Pomme De Neige. This beautiful Canadian fruit never fails to produce a good crop. Its flavour is delicate, and to my own taste at least is one of the finest dessert Apples. It keeps well, retaining its flavour even till the middle of February.*

11. Blenheim or Woodstock Pippin. This large and handsome Apple I have found to answer better on an espalier than on the wall. It is hardy and good, but has little flavour here.

12. Hollandbury, also known as KIRKE's Scarlet Admirable. This large and handsome Apple does not acquire here the qualities I have seen ascribed to it. It is a good fruit certainly, but it is excelled by many. It is in season during November.

* This Apple does not derive its name from the whiteness of its flesh, but from that of a village where it is much cultivated. This I state on the authority of a friend who lived several years in Canada.

13. Scarlet Pearmain. This Apple is greatly and deservedly admired, its good qualities not being exceeded by its great beauty. When fully ripe it is most delicious; but though it keeps sound till February, it quickly loses its rich saccharine flavour. Its bright colour renders it highly ornamental.

14. Court of Wick. This, from the colour it acquires, seems to become perfectly ripe in ordinary seasons, but it does not maintain the high character it has acquired in England; it is here no more than a good ordinary Apple. This may be owing to the soil being ill suited to it.

15. Alexander. This very large and beautiful Russian Apple I find to be hardy, and it comes to perfection in ordinary seasons. Its size, shape, and colour, are however its best qualities, as it is an indifferent fruit, and does not keep longer than a few weeks.

16. LOAN's Pearmain. This is an old Apple, and a fine one, but not often met with. It is not very hardy, but ripens well in ordinary seasons.

17. Cambusnethan Pippin. This is an Apple from Clydesdale; but though there called a seedling, it is not of recent origin. It is a very handsome large fruit, and a plentiful bearer. It requires a favourable season to bring it to perfection, as it is late (indeed remarkably so) in coming into blossom.

I have several other Apple trees, espaliers and standards, some very fine, which are hardy, but without names. On the wall I have the following, among others less uncommon in this country.

1. Reinette de Canada, which is in some places called

the American Newtown Apple. It is however unknown in Canada, and is probably a French Apple. It acquires a great size, and is in perfection in January, February and March. I do not think it would do without a wall in this country.

2. Margil. This is an old Apple, but few can compete with it in excellence. It is singular it should so seldom be met with in Scotland. It is superior in my opinion to the Ribstone Pippin.

3. Beauty of Wilts. This is a large Apple, but not possessing much merit, except in its appearance. Like the Blenheim, it is very firm and dense.

4. Hughes's Golden Pippin. This is a fruit of great excellence, but its season is over in January. It is of good size, and a very desirable table fruit.

It is interesting to observe that so considerable a number of fine Apples are so hardy as to bear the climate of this northern region.

I will now proceed to give you a short account of the five seedling Apples which I sent last Autumn.

I was anxious, in beginning to raise Apples from seeds, to obtain some that would ripen in this climate, and keep well. As the Nonpareil is a great favourite with me, but does not succeed here except on the wall, and as the Manx Codlin ripens very early, I selected these two for crossing, but have forgotten which was the male, and which the female parent of the kinds I raised from them. The result, however, is interesting, inasmuch as it proves that, from any two Apples the probability is that an almost endless variety may be obtained, there being, apparently, circumstances connected with

impregnation, but unknown to us, that tend to variation. This idea however must be limited; because, when an experiment of crossing is made, there may be many varieties of Apples from which an accidental mixture may arise. Not only may the pollen of several varieties be carried about by insects and mixed together, and thus be applied to the female organ selected for experiment, but it is possible that before the particular pollen to be used is applied, impregnation, partial or complete, may have taken place. To obtain, therefore, an absolute assurance of a simple mixture of two varieties, only the two selected should be in the same garden. I doubt if any mode of protection could be effected, because the exclusion of the most minute insect is necessary; and any material used for protection so tight as to exclude these, would exclude air also. It is more than probable we may obtain abundance of new varieties by simply sowing the pips of different Apples without artificial impregnation, and by selecting such plants as bear certain marks that give the fairest chance of good varieties, and which I will point out.

From the seeds of a single Apple, impregnated as above stated, plants sprung, and five were selected, of strong growth, and having the under side of the leaves more or less covered with down. These are the most certain marks for selection, but the down sometimes does not appear till the third year; the shape and size of the leaf are also good indications, where the quantity of down might be considered rather scanty. The quantity of this on the bark of the young tree varies much, and I am inclined to reject all plants which have but little on the shoots and leaves, but none that have much

on either or both. The less thorny appearance which the side shoots have the better, but this appearance may continue for several years, and diminish as the tree approaches its bearing age.

Of these five plants, two, the Kinellan Apple and the Tarvey Codlin, first shewed fruit in 1825.

The tree called the *Kinellan Apple*, resembles in growth the Nonpareil, being strong and spreading. The foliage and bark also resemble that of the Nonpareil, but are rather paler. In size the Apple resembles the Manx Codlin, and in appearance and other qualities the Nonpareil. There is also another strong indication of this being a mixture of the above two Apples only; that while the juiciness and sharpness of flavour belonging to the Nonpareil are conspicuous, the freeness and melting of the flesh, as it is called, belongs to the Manx Codlin. The merits of this Apple are considerable, for while it is a pleasant table Apple, in season from the beginning of December till January (keeping till March, though falling off,) it will stand competition with any kitchen Apple I am acquainted with. Its skin is a clear pale green, very little dotted, but strongly coloured with yellowish bright red on the exposed side. The eye is rather angular, the stalk downy, the flesh white, firm, rather juicy and pleasant.

The growth of the *Tarvey Codlin* is that of the Manx Codlin, but not quite so upright. The fruit resembles it in shape, though it is not so large, and it has a larger proportion of yellow in the ripened colour than the Kinellan. Its flavour is higher, and it is a very good Apple during its season, in November and part of December. It keeps longer, but loses its flavour entirely. It may be doubted whether the

seed (though out of the same Apple,) from which this tree sprang, was fecundated by the pollen of the Nonpareil. The stalk is short and deeply sunk, the eye shallow, contracted and plaited. The skin is a dull olive green, with an imperfect mixture of yellow; on the exposed side it is yellowish red, much spotted with broken rows of large blood red dots. The flesh is white and juicy, with the taste of an English codlin.*

A good many years ago, I received from Mr. KIRKE of Brompton, specimens of the Apples growing in his nursery. I kept the seeds of the best of them, and from these I had many plants, out of which I selected some, three of which have produced fruit which I think worthy of notice, and will now describe.

The first is the *Contin Reinette*, a variety that has been highly approved. This tree is of slender and spreading growth, and seems to be well distinguished by the appearance of the blossom buds, which are, in their early stage, much elongated, and slenderly set on the spur. They appear unfortunately, to have some peculiar attraction for Bullfinches, which last spring destroyed almost the whole promise of the tree; it was with difficulty, I saved a few specimens from the later buds. It is a small handsome fruit of a deep

* While this Paper was passing through the press, the following note was communicated by Sir G. MACKENZIE:

A third of these trees, the *Kerkan* Apple, produced fruit in 1827; and in 1828 it bore plentifully. It is a moderately-sized fruit, green when taken from the tree, becoming yellowish when over ripe. It is a mild and very pleasant dessert Apple in November; but though it keeps till January, it loses flavour. It carries heavy crops, and is a desirable variety.

dull yellow, richly painted with red on the exposed side, and a little marked with russet about the stalk. The flesh is firm, rather yellow, not particularly juicy, yet highly flavoured, with a little agreeable acid. Its season ends with January, commencing with December, or the end of November.

The *Coul Blush Apple* is one of the prettiest I have ever seen. The specimens sent to the Society were of the first produce; they lead to the expectation of the Apple being very large. These qualities, together with those of the flesh, which are very agreeable, though not first rate, make me think it probable that this Apple will become a favourite in the market. I have kept it till the beginning of February, but it becomes inferior after the first week of January. The crop, though the first, was very large. The fruit has the angular figure of the Calvilles. The skin is a clear waxy yellow with a dull red cheek, which is varied by numerous bright crimson dots and streaks. The stalk is slender and smooth. The flesh is rather yellow, crisp and juicy, with a very pleasant brisk taste.

The *Sweet Topaz Apple* is handsome, and remarkable for the total absence of acid in all its stages of growth. It is not destitute of flavour, and many persons are fond of it. I had expected it to prove valuable for making cider, but I suspect the juice is not sufficiently abundant; yet it is unusually saccharine, and may prove useful to be mixed with other cider Apples. It may improve in the climate of the South of England.

From the success that has hitherto attended my mode of selecting seedling plants, I am disposed to think artificial impregnation unnecessary for procuring new and good vari-

eties, and this opinion may induce many to seek for new sorts, whom the trouble and nicety required for the artificial process might have deterred.

By sowing plenty of pips, the most promising plants being selected, less room will be occupied, so that a few may be raised in the smallest garden. It is very probable, that, if the practice of raising Apple plants from seed becomes more common, we may obtain fruits of our own, that will leave even the Newtown Pippin behind.

The seedling Apples above described, particularly the Kinellan and Contin Reinette have the valuable quality of resisting the wind when on the trees..

I am, my dear Sir,

very truly your's,

GEORGE STEUART MACKENZIE.

Coul, near Dingwall,
March 12th, 1827.

XXXIX. *On the Cultivation of the Strawberry. In a Letter to the Secretary. By Sir* GEORGE STEUART MACKENZIE, *Bart. F. H. S.*

Read March 4, 1828.

MY DEAR SIR,

I HAVE been somewhat surprized to find that the Downton Strawberry is not esteemed in many parts of Scotland; and when a Nurseryman, who happened to be in my garden last year after the first and finest fruit had been gathered, and only the inferior berries remained, expressed his surprize at the beauty and quality of the fruit, and at its being the Downton, I could not help thinking that the *true* one is not yet known. I never saw any thing more beautiful than my rows of Downtons were last year, many of the first berries of the cockscomb shape measuring $5\frac{1}{2}$ and 6 inches. I consider this as the standard Strawberry for it's season; and that in seeking new varieties, we have only to look for earlier and later sorts. The first plants I obtained were from Mr. KNIGHT, and I have been careful to keep them distinct from all others. But there is one cause, hitherto overlooked, which produces other sorts in the rows after two years. Many berries decay, and are passed over, and inferior ones are not gathered. The seeds from these drop, and new sorts come up, and if runners from them are taken, of course they are not the true sort. The only way to preserve a variety pure, is to have some stocks in a corner from whence runners are to be taken,

and in which the fruit scapes are not suffered to remain after the first ripe berries have been gathered. My mode of planting Strawberries is this. The ground being well dug over, trenches are made where the rows are to be planted, about half a spade deep, and one in breadth. Rotten dung is then put into the trenches, and dug into the bottom, mixing it well with the earth. The trenches (two feet apart) are now filled up, and the runners planted over them in February, taken fresh from the stocks, with the roots and leaves untouched. A very common and absurd practice is to cut away the leaves, and to shorten the roots. I take sometimes three crops, but in general only two, after which the ground is dug, and trenches made as before. The year of planting is not considered that in which a crop is to be obtained, though when the runners are strong and fresh, they sometimes produce a tolerable supply.

It has of late been recommended not to dig the earth between the rows; and I conceived that hoeing was sufficient. But there is an objection to this last, which has made me again resort to digging, which is, that in gathering the runners, weeds, and stones, the plants are too much denuded, whilst it appears to me that it is of importance to keep the soil well up to the plants. I do not remove the dead leaves, nor the runners till spring.

The recommendation to treat the Alpine Strawberry as an annual, I have not attended to; because by so treating it you have your rows planted with good, bad, and indifferent fruit. The Alpine sports into varieties, less marked indeed than those of other kinds, but sufficiently distinguishable by size and flavour. For some years past I have been in the habit

of sowing seeds and selecting plants, in order to obtain varieties possessing particular qualities. In tasting them, I have been often disappointed; and at present I have only two fine varieties. Some seeds were sent to me last year among other things from the Society's store, and from the produce I have selected a considerable number of plants differing from each other in the size, shape, rugosity, pubescence, serrature and colour of the leaves, out of about twenty selected plants last year, only three or four yielded tolerable fruit, and but one a finely flavoured Strawberry. This single plant has produced so many runners that I have made a considerable plantation from it. From my own experience, therefore, I suspect that to treat the Alpine as an annual is not correct; and that to manage it in the same manner as other Strawberries is better. That this is the general understanding in Scotland, appears from the circumstance of the Caledonian Horticultural Society having offered a prize for an Alpine Strawberry possessing particular qualities and properties.

The Market of Edinburgh, so long famed for Strawberries, seems to have fallen off very much; not indeed in the quantity of fruit supplied, but in its quality. The reason is that the plantations are not often enough renewed. The Surinam, called in Edinburgh the Hautbois, has lost its character merely from improper cultivation. It is in reality a rich and finely flavoured fruit, and preserves whole better than any other sort I have yet seen tried. It has the quality of producing good fruit, without renewal, during a longer period than any other, and that too on poor ground, the crops being most abundant.

It appears curious that no new Strawberry has yet been

produced which is earlier with us than the Old Scarlet. In my garden the Alpine is the first ripe, as well as the one that continues latest; and the Duke of Kent is not with me, as in the neighbourhood of London, earlier than the Old Scarlet; a proof, perhaps, that the climate affects the relative earliness and lateness of fruits.

I am, my dear Sir,
your's sincerely,
GEORGE STEUART MACKENZIE.

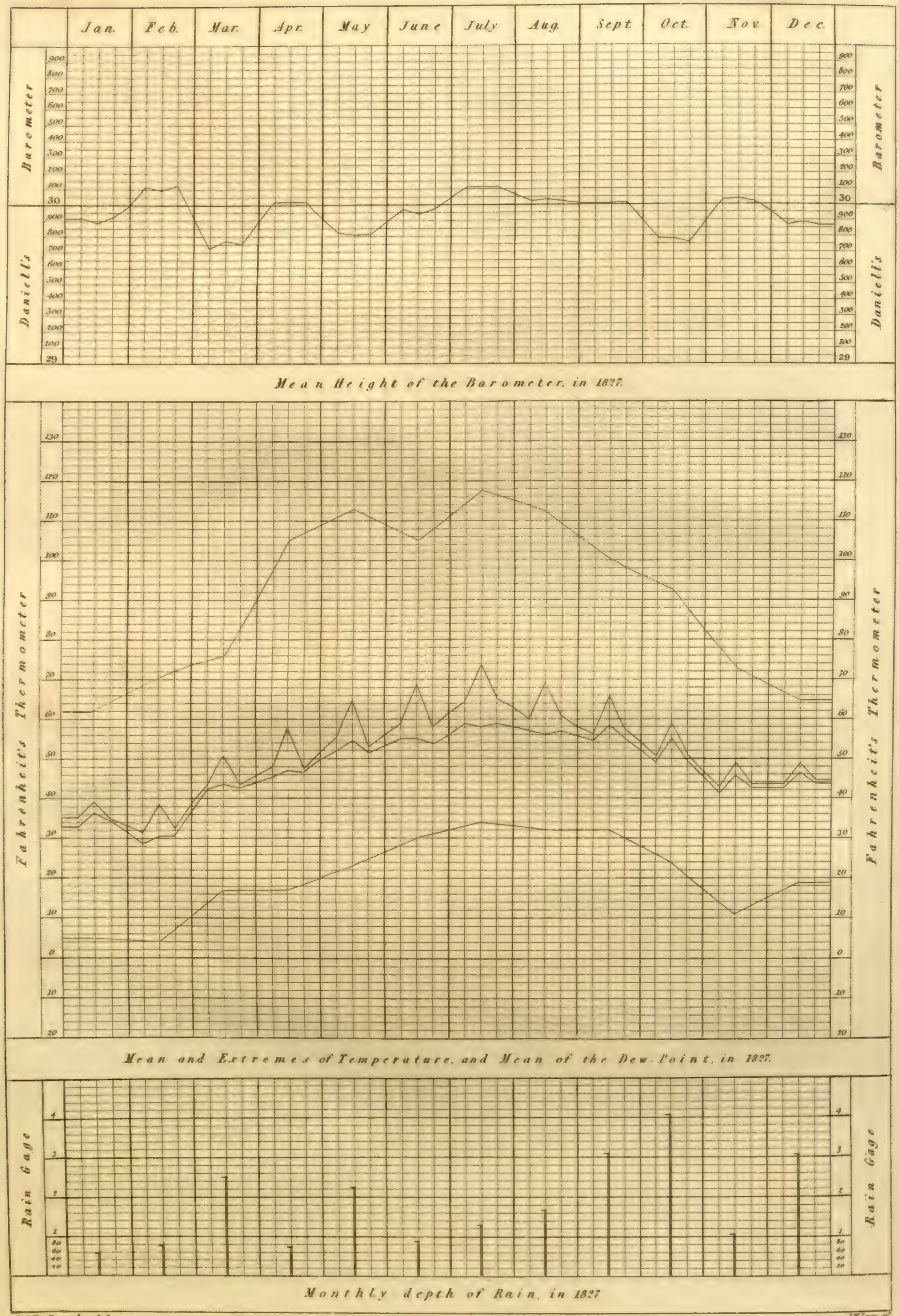
Coul, near Dingwall, N. B.
1*st March*, 1828.

XL. *Journal of Meteorological Observations made in the Garden of the Horticultural Society at Chiswick during the year* 1827. *By Mr.* William Beattie Booth, *A. L. S.*

Read February 19, 1828.

In compliance with the resolution of the Garden Committee of February the twenty-eighth 1825, the following Meteorological Journal has been kept in the Garden of the Society during the year 1827.

The same plan has been adopted in recording the observations, and the same instruments used in making them, as those already described in the present volume of the Society's Transactions, page 97. The only alteration that has taken place, has been the removal of the thermometer for ascertaining the temperature in the sun's rays to a space in the Arboretum in which the other thermometers are situated; the former station, as mentioned in vol. vii. page 100, having been considered objectionable on account of its being too near a Garden wall, the radiation from which, as well as from the border on which the thermometer stood, would naturally cause a greater degree of heat to be indicated, than if it was exposed under common circumstances. It is now placed on the grass in the Arboretum about two inches from the ground, and thus shews the maximum degree of heat to which vegetation is exposed during the day, whilst the radiating thermometer exhibits the opposite extreme in the same situation during the night.


Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sept.
Oct.
Nov.
Dec.
Barometer
Daniell's
Mean Height of the Barometer, in 1827.
Fahrenheit's Thermometer
Mean and Extremes of Temperature, and Mean of the Dew-Point, in 1827.
Rain Gage
Monthly depth of Rain, in 1827

W.B. Booth. del.

The results of these two instruments are highly interesting, particularly those of the radiating thermometer, from which it appears, that only in one month (July) was the minimum temperature observed to be above the freezing point; this is exemplified by the lower line in the middle one of the three opposite diagrams, which are similar to those appended to the Journal of 1826, and which are fully explained at page 128 of this volume of the Transactions of the Society. They exhibit the mean pressure, temperature, and dew point, at three periods of the day during each month in the year, as well as the extremes of temperature in the sun, and of that produced by radiation; together with the quantity of rain which fell in each month, amounting to 22.18 inches in the course of the year.

The monthly mean results, as well as the average mean for the year, arranged in a tabular form, similar to one which Dr. BURNEY, of Gosport, had the kindness to communicate to me, will be found at the end of the Journal.

JANUARY.

1827.		Morning.					Noon.					Night.				
	Days.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.
M.	1	30.088	45	41	4	Fine	29.882	47	45	2	Cloudy	29.789	34	34	—	Clear and Cold
Tu.	2	29.584	38	35	3	Cold & Cloudy	—.592	40	36	4	Showery	—.604	30	30	—	Frosty
W.	3	—.580	20	14	6	Frosty	—.544	32	24	8	Fine	—.596	21	20	1	Hard Frost
Th.	4	—.739	20	13	7	Hard Frost	—.749	25	20	5	Hard Frost	—.940	31	29	2	Frosty
☽ F.	5	30.136	32	30	2	Frosty	30.231	32	27	5	Ditto	30.379	26	25	1	Ditto
S.	6	—.403	28	25	3	Ditto	—.399	36	36	—	Slight Rain	—.393	36	36	—	Wet
S.	7	—.176	42	42	—	Slight Rain	—.162	44	44	—	Cloudy	—.216	41	41	—	Foggy
M.	8	—.162	48	48	—	Foggy	—.024	52	52	—	Foggy	29.916	49	49	—	Ditto
T.	9	29.943	50	49	1	Cloudy	29.717	49	45	4	Fine	—.913	42	39	3	Clear
W.	10	— 927	45	44	1	Ditto	—.607	49	49	—	Stormy	—.445	45	45	—	Wet
Th.	11	—.376	46	46	—	Slight Rain	—.304	48	48	—	Ditto, Sleet	—.336	47	47	—	Showery
F.	12	—.226	40	40	—	Sleet	—.599	42	40	2	Ditto	—.932	32	29	3	Frosty
○ S.	13	—.845	32	30	2	Cloudy	—.833	46	46	—	Rainy	—.758	46	46	—	Showery
S.	14	—.448	49	49	—	Showery	—.375	52	52	—	Ditto	—.803	46	45	1	Fine
M.	15	30.176	32	28	4	Fine	30.249	38	30	8	Very Fine	30.336	38	36	2	Ditto
T.	16	—.087	42	42	—	Cloudy	—.051	44	42	2	Showery	—.051	48	48	—	Wet
W.	17	—.356	40	39	1	Ditto	—.284	44	41	3	Cloudy	—.309	37	37	—	Thick Fog
Th.	18	—.282	35	35	—	Thick Fog	—.306	42	37	5	Ditto	—.325	31	31	—	Ditto
F.	19	— 311	32	32	—	Frosty	— 360	35	32	3	Fine	—.376	28	28	—	Foggy
☾ S.	20	—.263	27	26	1	Ditto & Foggy	—.282	34	32	2	Cloudy	—.080	32	32	—	Ditto
S.	21	29.913	27	27	—	Snowy	29.855	28	27	1	Cold & Snowy	29.675	25	25	—	Snowy
M.	22	—.573	29	27	2	Stormy	—.674	29	24	5	Ditto	—.708	23	21	2	Frosty
T.	23	—.672	27	26	1	Slight Snow	—.652	32	27	5	Cold & Cloudy	—.593	26	25	1	Ditto
W.	24	—.621	29	27	2	Frosty	—.648	36	29	7	Fine	—.706	31	31	—	Foggy
Th.	25	—.701	30	29	1	Thick Fog.	—.697	32	29	3	Cloudy	—.746	27	26	1	Ditto
F.	26	—.762	26	25	1	Hard Frost	—.778	32	30	2	Frosty	—.796	33	30	3	Stormy
● S.	27	30.141	29	26	3	Ditto	30.288	36	25	11	Very Fine	30.341	25	25	—	Clear
S.	28	—.183	27	26	1	Frosty	—.165	40	34	6	Fine	—.151	40	40	—	Foggy
M.	29	29 970	44	44	—	Thaw, Cloudy	29.956	45	43	2	Cloudy	29.931	37	37	—	Ditto
T.	30	—.837	39	38	1	Fine	—.812	44	35	9	Fine	—.796	39	38	1	Clear
W.	31	—.758	38	38	—	Foggy	—.750	45	43	2	Cloudy	— 808	45	45	—	Cloudy
		29.910	35	33.5	1.5		29.897	39.6	36.2	3.4		29.927	35.1	34.5	.6	

JANUARY.

Days.	Temperature.				Wind.		Rain.	
	Max.	Min.	Sun.	Rad.	Direction.	Force.	In. Pts.	Remarks.
1	50	33	61	27	NW	Brisk		
2	40	20	60	15	N	Ditto		At the commencement of the month a sharp frost set in, which continued only for a few days, and was succeeded by rough unsettled weather until the 19th, accompanied generally with high winds at night; that of the 14th was very boisterous. Snow fell on the 20th and 21st, to the depth of nearly two inches, and disappeared on the 29th, when the weather became more seasonable.
3	32	—12	38	— 5	——	Ditto		
4	29	28	52	24	——	Ditto		
5	33	24	52	19	——	Little		
6	36	35	42	32	SW	Ditto	.20	
7	44	40	45	37	——	Ditto		
8	+53	48	53	44	——	Ditto		
9	52	38	55	32	W	Strong		
10	49	33	51	30	NW	Ditto	.33	
11	48	32	49	28	——	Ditto	.05	
12	42	28	47	24	W	Little	.08	
13	46	44	46	40	NW	Ditto		
14	52	32	52	23	——	Boisterous	.05	
15	41	34	56	30	——	Brisk		
16	46	35	47	32	SW	Little	.04	
17	46	34	50	31	NE	Ditto		
18	42	26	42	19	——	Ditto		
19	36	22	44	12	E	Brisk		
20	34	19	36	11	——	Ditto		
21	32	24	32	18	NE	Ditto		
22	30	19	32	14	——	Ditto		
23	32	25	45	19	NW	Little		
24	36	22	40	16	W	Ditto		
25	31	15	32	11	NW	Ditto		
26	36	29	44	26	——	Stormy		
27	36	17	54	10	N	Little		
28	44	36	52	36	SW	Ditto		
29	45	35	51	27	——	Ditto		
30	45	34	+62	25	S	Ditto		
31	46	37	46	34	——	Ditto		
	40.7	29.2	47.3	24.2			0.57	

Mean Pressure from the 3 daily observations 29.911 inches.
—— Temperature .....Ditto..... 36°.5
—— Dew Point .....Ditto..... 34°.7
—— Degree of Dryness ..Ditto..... 1°.8
—— Degree of Moisture.Ditto..... 935°
—— Force of Vapour ...Ditto..... 0.232 inch.
Least observed degree of Moisture..... 685°
Maximum Temperature in Shade..... 53°
M nimum Temperature in ditto..... 12°
Maximum Temperature in Sun..... 62°
Minimum of Terrestrial Radiation..... 5°

WINDS.

North.....5 days.	South.....2 days.
N. East.....4	S. West.....6
East.....2	West.....3
S. East.....0	N. West.....9

31 days.

Amount of Rain..... 0.57 inch.

FEBRUARY.

1827.		Morning.					Noon.					Night.				
	Days.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.
Th.	1	29.793	38	37	1	Dull & Cloudy	29.775	46	45	1	Cloudy	29.838	38	38	—	Slight Rain
F.	2	—.842	36	33	3	Fine	30.162	41	32	9	Cold	30.143	34	34	—	Sleet
☽ S.	3	30.432	30	27	3	Cold	—.524	38	28	10	Fine	—.635	34	32	2	Fine
S.	4	—.617	30	25	5	Ditto & Frosty	—.623	40	30	10	Cold	—.597	33	30	3	Clear
M.	5	—.569	32	30	2	Ditto	—.564	37	26	11	Fine	—.473	32	31	1	Ditto
T.	6	—.357	32	30	2	Cloudy	—.341	38	36	2	Cloudy	—.472	34	32	2	Ditto
W.	7	—.592	30	29	1	Ditto	—.496	40	31	9	Clear & Cold	—.500	30	26	4	Ditto
Th.	8	—.527	31	25	6	Frosty & Fine	—.520	35	25	10	Ditto	—.585	30	28	2	Ditto
F.	9	—.486	30	24	6	Ditto	—.413	35	20	15	Fine	—.332	28	26	2	Ditto
S.	10	—.235	30	21	9	Ditto	—.147	38	30	8	Ditto	—.073	31	28	3	Ditto
⊙ S.	11	29.897	30	27	3	Cloudy	29.889	36	30	6	Ditto	29.883	34	34	—	Cloudy
M.	12	—.931	35	35	—	Sleet	30.020	35	24	11	Clear & Cold	30.038	33	33	—	Ditto
T.	13	30.187	30	24	6	Frosty & Cold	—.221	40	29	11	Ditto	—.266	32	28	4	Fine
W.	14	—.141	31	28	3	Ditto	—.089	41	34	7	Cloudy	—.020	32	31	1	Ditto
Th.	15	29.923	36	34	2	Cloudy	29.921	39	29	10	Fine	—.073	28	26	2	Ditto
F.	16	30.211	22	19	3	Frosty & Fine	30.209	35	20	15	Do. but Cold	—.158	25	25	—	Frosty
S.	17	—.039	21	19	2	Ditto	29.989	30	19	11	Ditto	—.049	24	24	—	Fine
S.	18	—.125	19	17	2	Ditto	30.141	32	23	9	Ditto	—.133	25	23	2	Ditto
☾ M.	19	29.993	29	26	3	Ditto	29.928	36	31	5	Ditto	29.854	23	20	3	Ditto
T.	20	—.765	28	23	5	Ditto	—.744	33	24	9	Ditto	—.734	28	26	2	Clear & Fine
W.	21	—.717	29	27	2	Ditto	—.725	40	36	4	Cloudy	—.828	35	34	1	Ditto
Th.	22	—.923	34	30	4	Very Fine	—.978	40	32	8	Very Fine	30.171	28	25	3	Ditto
F.	23	30.185	27	24	3	Ditto	30.109	40	25	15	Ditto	—.055	34	32	2	Ditto
S.	24	—.018	35	31	4	Ditto	—.014	45	28	17	Ditto	—.141	25	25	—	Cloudy
● S.	25	—.234	25	23	2	Frosty	—.242	44	27	17	Ditto	—.130	34	34	—	Ditto
M.	26	29.906	44	44	—	Slight Rain	29.898	47	47	—	Slight Rain	29.753	46	46	—	Ditto
T.	27	—.553	51	49	2	Fine	—.539	54	53	1	Cloudy	—.769	48	48	—	Wet
W.	28	—.718	41	41	—	Wet	—.522	48	48	—	Wet	—.459	48	48	—	Ditto
		30.104	31.6	28.6	.3		30.098	39.3	30.7	8.6		30.113	32.2	30.9	1.3	

FEBRUARY.

Days.	Temperature.				Wind.		Rain.	
	Max.	Min.	Sun.	Rad.	Direction.	Force.	In.	Pts.
1	46	34	46	31	SE	Little		.01
2	41	28	54	21	E	Brisk		
3	38	27	45	20	——	Ditto		
4	40	28	41	21	——	Ditto		
5	38	23	45	14	——	Little		
6	40	30	41	27	SE	Ditto		
7	40	29	53	23	E	Ditto		
8	37	29	47	22	——	Brisk		
9	37	27	48	20	——	Ditto		
10	39	29	50	24	——	Ditto		
11	36	29	36	22	NE	Ditto		
12	35	28	42	21	——	Ditto		
13	41	26	47	17	N	Ditto		
14	41	27	52	18	NW	Little		
15	40	17	57	7	N	Ditto		
16	35	15	62	6	——	Ditto		
17	34	−15	53	− 4	——	Brisk		
18	30	20	40	14	NE	Ditto		
19	36	20	42	15	N	Ditto		
20	35	29	40	23	——	Ditto		
21	39	30	42	25	——	Ditto		
22	41	20	59	13	——	Ditto		
23	42	20	53	12	NW	Little		
24	47	24	+71	10	S	Ditto		
25	44	31	62	27	——	Ditto		
26	48	46	57	43	——	Strong		.04
27	+57	40	62	36	W	Ditto		.40
28	50	48	50	45	——	Ditto		.34
	40.2	27.6	49.9	20.7				.79

Remarks.

The weather during the whole of the month was unusually cold, with brisk easterly winds; and it will be observed that the temperature was considerably below the average mean, which for this month is allowed to be 38°. The days were generally clear, with sunshine.

Mean Pressure from the 3 daily observations	30.105 inches.
—— Temperature.....Ditto.....	34°.3
—— Dew Point.....Ditto.....	30°.
—— Degree of Dryness..Ditto.....	4°.3
—— Degree of Moisture Ditto.....	862°
—— Force of Vapour...Ditto.....	0.200 inch.
Least observed degree of Moisture.....	55°.
Maximum Temperature in Shade.....	57°
Minimum Temperature in ditto.....	15°
Maximum Temperature in Sun.....	71°
Minimum of Terrestrial Radiation.....	4°

WINDS.

North.....8 days.	N. East.....3 days
East.....8	S. East.....2
South.....3	S. West.....0
West.....2	N. West.....2

28 days.

Amount of Rain.....0.79 inch.

MARCH.

1827.		Morning.					Noon.					Night.				
	Days.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.
Th.	1	29.339	50	50	—	Cloudy	29.408	55	52	3	Cloudy	29.479	40	40	—	Wet
F.	2	—.343	51	51	—	Rainy	—.370	47	45	2	Ditto	—.555	40	39	1	Cloudy
S.	3	—.468	43	43	—	Cloudy	—.403	47	47	—	Slight Rain	—.087	47	47	—	Ditto
S.	4	28.881	48	48	—	Ditto	—.200	50	49	1	Ditto	—.313	37	37	—	Stormy
☽ M.	5	29.756	32	32	—	Frosty	—.574	49	46	3	Cloudy	—.238	45	45	—	Ditto
Tu.	6	28.988	42	42	—	Showery	28.900	50	50	—	Stormy	— 173	47	47	—	Ditto
W.	7	29.368	39	38	1	Ditto	29.501	52	49	3	Ditto	—.048	48	48	—	Ditto
Th.	8	28.892	47	45	2	Cloudy	28.936	50	32	18	Very Fine	— 210	40	40	—	Cloudy
F.	9	29.406	32	32	—	Frosty	29.468	41	29	12	Ditto	—.554	32	31	1	Fine
S.	10	—.738	32	29	3	Fine	—.889	45	35	10	Ditto	—.569	39	39	—	Cloudy
S.	11	—.579	51	51	—	Cloudy	—.613	56	56	—	Stormy	—.675	49	49	—	Wet
M.	12	—.708	50	50	—	Very Fine	—.881	56	47	9	Very Fine	—.918	47	47	—	Ditto
○ Tu.	13	—.857	47	45	2	Ditto	—.912	55	50	5	Ditto	—.764	51	51	—	Ditto
W.	14	—.860	48	45	3	Fine	—.914	55	35	20	Ditto	—.994	42	42	—	Cloudy
Th.	15	—.652	44	44	—	Wet	- .676	46	42	4	Stormy	— 856	38	37	1	Ditto
F.	16	30.156	36	34	2	Fine	30.182	50	35	15	Very Fine	—.967	43	42	1	Ditto
S.	17	29.419	45	43	2	Ditto	29.902	49	49	—	Very Stormy	—.768	38	38	—	Sleet Showers
S.	18	30.064	37	33	4	Ditto	30.223	45	39	6	Fine	30.303	32	31	1	Frosty
M.	19	—.376	36	34	2	Fine	—.370	46	46	—	Showery	—.372	42	42	—	Cloudy
☾ Tu.	20	—.291	47	47	—	Cloudy	—.275	51	51	—	Fine	- .261	49	49	—	Ditto
W.	21	—.154	50	50	—	Ditto	—.120	55	47	8	Very Fine	—.148	49	49	—	Wet
Th.	22	—.107	47	45	2	Fine	—.125	56	48	8	Ditto	—.133	48	46	2	Very Fine
F.	23	—.127	50	46	4	Very Fine	—.119	60	51	9	Ditto	—.157	47	46	1	Fine
S.	24	—.107	50	47	3	Ditto	—.091	55	41	14	Ditto	29.885	49	49	—	Cloudy
S.	25	—.009	47	46	1	Fine	29.947	52	40	12	Cloudy	30,037	40	39	1	Fine
M.	26	— 293	37	33	4	Very Fine	30.279	48	33	15	Very Fine	—.243	41	39	2	Cloudy
● Tu.	27	—.026	42	39	3	Ditto	29.949	50	48	2	Ditto	29.789	50	50	—	Ditto
W.	28	29.715	48	46	2	Ditto	—.542	55	50	5	Fine	—.177	47	47	—	Wet
Th.	29	—.250	43	41	2	Cloudy	—.305	47	42	5	Cloudy	—.343	39	37	2	Cloudy
F.	30	—.449	43	41	2	Ditto	—.591	50	38	12	Hail Showers	— 696	42	39	3	Fine
S.	31	30.134	42	36	6	Very Fine	30.180	50	39	11	Cold & Cloudy	30.563	44	40	4	Ditto
		29.726	43.7	42 1	1 6		29.769	50.9	43.9	7.		29.750	43.2	42.6	.6	

MARCH.

Days.	Temperature.				Wind.		Rain.	Remarks.
	Max.	Min.	Sun.	Rad.	Direction.	Force.	In. Pts.	
1	56	46	61	41	SW	Strong	.62	
2	49	36	56	31	W	Ditto		
3	51	42	63	36	——	Ditto	.05	Although the temperature of this month was somewhat above the average mean, yet the weather upon the whole was very unseasonable and wet, with strong gales of wind at night, those of the 17th and 28th were very boisterous. The sudden fall of the barometer on the 4th, 6th, and 8th, and its rise on the 31st is remarkable.
4	52	32	62	27	SW	Ditto	.02	
5	50	42	65	39	——	Ditto		
6	51	36	57	32	——	Stormy	.25	
7	52	40	67	38	S	Ditto	.04	
8	50	28	57	20	——	Little		
9	42	28	54	21	NW	Ditto		
10	47	36	62	32	SW	Ditto	.21	Mean Pressure from the 3 daily observations 29.748 inches.
11	57	46	64	42	W	Strong	.20	—— Temperature ..... Ditto..... 45°.9
12	56	40	67	35	——	Little	.02	—— Dew Point ..... Ditto..... 42°.9
13	55	44	71	38	NW	Ditto	.25	—— Degree of Dryness..Ditto..... 3°
14	56	44	62	41	——	Strong		—— Degree of Moisture Ditto..... 894°
15	49	32	59	26	W	Ditto	.05	—— Force of Vapour .. Ditto..... 0.304 inch.
16	50	40	66	38	——	Ditto	.25	Least observed degree of Moisture ..... 504°
17	50	33	53	28	NW	Stormy	.04	Maximum Temperature in Shade..... 60°
18	39	—27	57	—17	——	Little		Minimum Temperature in ditto..... 27°
19	47	42	56	36	W	Ditto	.01	Maximum Temperature in the Sun..... 76°
20	54	47	57	45	——	Ditto		Minimum of Terrestrial Radiation..... 17°
21	56	46	59	42	SW	Ditto		
22	57	44	70	38	W	Brisk		
23	+60	41	72	36	——	Little		
24	57	43	69	39	——	Ditto		
25	52	29	66	20	——	Ditto		
26	54	30	+76	21	——	Ditto		
27	50	39	54	37	——	Brisk		
28	55	37	64	33	NW	Boisterous	.34	
29	52	33	64	28	——	Strong		
30	51	35	65	29	N	Ditto	.15	
31	52	37	66	32	——	Ditto		
	51.9	37	62.6	32.8			2.50	

WINDS.

North.....2 days.		N. East.....0 days.	
East.....0		S. East.....0	
South 2		S. West.....6	
West 14		N. West.....7	
	31 days.		

Amount of Rain..... 2.50 inches.

APRIL.

1827.		Morning.					Noon.					Night.				
	Days.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.
S.	1	30.221	44	44	—	Showery	30.207	48	46	2	Dull & Cloudy	30.213	46	46	—	Fine
M.	2	—.143	48	48	—	Foggy	—.139	60	55	5	Ditto	—.135	52	51	1	Ditto
Tu.	3	—.123	50	50	—	Ditto	—.127	56	53	3	Ditto	—.113	51	50	1	Cloudy
☽ W.	4	—.141	51	49	2	Fine	—.139	59	51	8	Very Fine	—.135	46	44	2	Fine
Th.	5	—.127	50	47	3	Ditto	—.121	64	54	10	Ditto	—.181	48	45	3	Ditto
F.	6	29.970	54	50	4	Very Fine	29.976	69	54	15	Ditto	—.054	56	56	—	Wet
S.	7	30.150	52	47	5	Ditto	30.142	61	45	16	Ditto	—.166	55	53	2	Very Fine
S.	8	—.386	53	47	6	Ditto	—.352	60	45	15	Ditto	—.275	49	49	—	Cloudy
M.	9	—.142	54	48	6	Ditto	—.048	62	48	14	Ditto	29 972	49	47	2	Clear
Tu.	10	29.900	48	46	2	Cloudy	29.904	59	57	2	Showery	—.920	51	51	—	Foggy
⊙ W.	11	—.912	51	51	—	Foggy	—.918	54	52	2	Ditto	—.912	50	49	1	Cloudy
Th.	12	—.819	52	52	—	Cloudy	—.924	53	53	—	Ditto	—.950	48	48	—	Ditto
F.	13	30.107	44	42	2	Very Fine	30 143	58	42	16	Very Fine	30.224	49	47	2	Fine
S	14	—.244	42	38	4	Ditto	— 208	58	37	21	Ditto	—.155	47	47	—	Ditto
S	15	—.101	50	50	—	Ditto	—.105	62	60	2	Ditto	—.091	49	49	—	Cloudy
M.	16	—.093	51	48	3	Ditto	—.099	55	40	15	Cloudy	—.103	47	45	2	Ditto
Tu.	17	—.071	50	48	2	Cloudy	—.101	55	47	8	Ditto	—.045	46	46	—	Wet
☾ W.	18	29.962	43	43	—	Dull & Cloudy	29.922	53	53	—	Wet	29.839	45	45	—	Foggy
Th.	19	—.815	49	47	2	Ditto	—.768	58	50	8	Fine	—.710	43	41	2	Clear
F.	20	—.687	42	42	—	Thick Fog	—.671	55	50	5	Ditto	—.603	45	44	1	Cloudy
S.	21	—.540	46	46	—	Rainy	—.569	49	48	1	Cold & Cloudy	—.626	48	48	—	Wet
S.	22	—.773	44	43	1	Cloudy	—.797	46	46	—	Wet	—.846	40	40	—	Cloudy
M.	23	—.773	40	36	4	Cold &Cloudy	— 723	45	38	7	Cold & Cloudy	—.690	36	35	1	Ditto
Tu.	24	—.561	42	41	1	Ditto	—.603	47	44	3	Do. with Hail	—.707	35	33	2	Clear & Cold
W.	25	—.886	40	37	3	Fine	—.907	52	36	16	Very Fine	30.023	36	35	1	Ditto
● Th.	26	30.160	40	34	6	Very Fine	30.221	50	29	21	Ditto	—.336	43	41	2	Ditto
F.	27	—.359	47	40	7	Ditto	—.325	60	35	25	Ditto	—.268	45	42	3	Very Fine
S.	28	—.171	52	47	5	Ditto	—.065	65	50	15	Ditto	—.057	52	50	2	Ditto
S.	29	29.979	55	53	2	Ditto	—.066	72	55	17	Ditto	—.098	55	52	3	Ditto
M.	30	30.074	60	56	4	Ditto	—.060	75	60	15	Ditto	—.050	66	63	3	Ditto
		30.013	48.1	45.7	2.4		30.011	57.3	47.8	9.5		30.016	47.6	46.4	1.2	

APRIL.

Days.	Temperature.				Wind.		Rain.	
	Max.	Min.	Sun.	Rad.	Direction.	Force.	In.	Pts.
1	50	40	52	38	SW	Little		
2	60	45	66	41	——	Ditto		
3	57	44	74	38	W	Ditto		
4	61	41	76	33	S	Ditto		
5	65	42	81	34	SE	Ditto		
6	70	45	83	43	S	Ditto		.05
7	62	48	81	44	SW	Ditto		
8	61	42	80	36	——	Ditto		
9	62	38	84	30	NW	Ditto		
10	59	49	75	45	SE	Brisk		.07
11	55	42	62	38	——	Ditto		.03
12	54	34	67	28	S	Little		.18
13	60	35	81	25	N	Ditto		
14	61	42	85	36	NW	Ditto		
15	62	44	76	40	W	Ditto		
16	55	34	70	28	NE	Ditto		
17	56	44	75	38	E	Ditto		.15
18	54	40	59	38	NE	Ditto		.06
19	60	34	70	28	——	Ditto		
20	55	42	63	40	——	Brisk		
21	50	41	51	40	——	Ditto		.04
22	46	36	53	33	——	Ditto		.03
23	46	31	54	23	S	Ditto		.07
24	49	29	67	25	SW	Little		.03
25	53	—25	69	—17	——	Ditto		
26	52	28	82	19	SE	Ditto		
27	61	37	79	31	——	Ditto		
28	68	39	83	32	——	Ditto		
29	75	40	95	35	S	Ditto		
30	+78	52	+105	45	— -	Ditto		
	58.5	39	73.2	34			0.71	

Remarks.

The quantity of rain which fell during this month is considerably below the average mean. The weather generally was clear and cold, attended with frosts at night; that during the nights of the 24th, 25th, and 26th, was even far more severe than the 29th of April, 1826, but was not attended with such fatal consequences, vegetation being upon the whole much later.

Mean Pressure from the 3 daily observations 30.013 inches.
—— Temperature.....Ditto..... 51°
—— Dew Point.....Ditto..... 46°.6
—— Degree of Dryness Ditto..... 4°.4
—— Degree of Moisture Ditto..... 850°
—— Force of Vapour. Ditto... ..... 0.352 inch.
Least observed degree of Moisture ..... 428°
Maximum Temperature in Shade ..... 78°
Minimum Temperature in ditto..... 25°
Maximum Temperature in the Sun..... 105°
Minimum of Terrestrial Radiation..... 17°

WINDS.

North..... 1 days.	N. East.....6 days.
East..... 1	S. East.....6
South..... 6	S. West.....6
West.....2	N. West.....2

30 days.

Amount of Rain..... 0.71 inch.

MAY.

1827.		Morning.					Noon.					Night.				
	Days.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.
T.	1	30.074	61	55	6	Very Fine	30.054	71	61	10	Very Fine	29.934	62	62	—	Slight Rain
W.	2	—.004	52	51	1	Foggy	—.060	66	60	6	Hazy	30.080	55	55	—	Thick Fog
Th.	3	—.062	58	52	6	Very Fine	29.953	71	56	15	Very Fine	29.910	57	55	2	Very Fine
☽ F.	4	29.910	56	53	3	Cloudy	—.869	68	52	16	Ditto	—.819	53	52	1	Cloudy
S.	5	—.692	55	54	1	Ditto	—.566	58	58	—	Slight Rain	—.508	55	55	—	Rainy
S.	6	—.321	54	54	—	Wet	—.212	60	60	—	Heavy Rain	—.404	46	46	—	Ditto
M.	7	—.655	51	47	4	Very Fine	—.696	55	47	8	Cloudy	—.625	44	43	1	Cloudy
T.	8	—.983	42	38	4	Cold & Cloudy	—.912	51	38	13	Ditto	—.920	45	45	—	Ditto
W.	9	—.847	47	42	5	Ditto	—.835	52	45	7	Ditto	—.831	46	45	1	Fine
Th.	10	—.811	51	47	4	Very Fine	—.815	61	51	10	Very Fine	—.813	46	44	2	Ditto
○ F.	11	—.805	51	43	8	Ditto	—.871	62	56	6	Slight Showers	30.025	49	49	—	Hazy
S.	12	30.069	47	43	4	Fine	30.139	58	46	12	Very Fine	—.147	45	43	2	Fine
S.	13	—.063	50	44	6	Ditto	29.926	60	40	20	Ditto	29.881	44	42	2	Ditto
M.	14	29.875	52	50	2	Cloudy	—.857	58	55	3	Cloudy	—.841	47	47	—	Wet
T.	15	—.829	52	49	3	Very Fine	—.807	66	60	6	Very Fine	—.752	51	49	2	Fine
W.	16	—.599	57	51	6	Ditto	—.595	67	60	7	Ditto	—.431	55	55	—	Wet
☾ Th.	17	—.607	59	55	4	Ditto	—.635	70	55	15	Ditto, Sultry	—.647	55	55	—	Ditto
F.	18	—.944	60	58	2	Ditto	—.735	65	57	8	Very Fine	—.804	56	56	—	Cloudy
S.	19	—.903	60	57	3	Ditto	—.981	67	51	16	Ditto	30.097	59	57	2	Very Fine
S.	20	30.079	59	56	3	Ditto	30.073	70	59	21	Ditto	—.135	55	53	2	Ditto
M.	21	—.128	62	57	5	Ditto	—.142	74	53	21	Ditto	—.193	59	57	2	Ditto
T.	22	—.123	60	57	3	Cloudy	—.109	71	65	6	Showery	—.087	55	55	—	Fine
W.	23	—.025	60	58	2	Ditto	29.905	64	60	4	Very Fine	29.670	55	55	—	Wet
Th.	24	29.464	60	58	2	D ito	—.404	60	50	10	Cloudy	—.400	50	50	—	Ditto
● F.	25	—.381	51	51	—	Wet	—.375	61	61	—	Wet	—.428	51	51	—	Cloudy
S.	26	—.451	57	53	4	Very Fine	—.492	66	61	5	Showery	—.554	52	52	—	Ditto
S.	27	—.833	60	53	7	Ditto	—.708	68	56	12	Very Fine	—.696	56	56	—	Wet
M.	28	—.697	60	58	2	Cloudy	—.796	67	60	7	Fine	—.936	65	65	—	Cloudy
T.	29	—.792	60	57	3	Ditto	—.800	64	62	2	Cloudy	—.840	54	53	1	Fine
W.	30	—.889	60	56	4	Ditto	—.899	70	54	16	Very Fine	— 810	61	58	3	Very Fine
Th.	31	—.707	64	58	6	Very Fine	—.729	68	52	16	Ditto	—.834	53	51	2	Ditto
		29.826	55.7	52.1	3.6		29.805	64.4	54.8	9.6		29.808	52.7	51.9	0.8	

MAY.

Days.	Temperature.				Wind.		Rain.	Remarks.
	Max.	Min.	Sun.	Rad.	Direction.	Force.	In. Pts.	
1	76	50	98	45	S.	Little		The weather during the greater part of this month was very changeable, and particularly chilly for the advanced period of the year. Thunder accompanied the rain on the evening of the 17th. Towards the latter end of the month some heavy gales of wind were experienced, chiefly from the south-west.
2	68	51	90	44	SW	Ditto		
3	71	50	92	40	——	Ditto		
4	68	50	86	45	——	Ditto		
5	59	50	68	48	——	Ditto	.50	
6	61	45	67	42	SE	Brisk	.23	
7	55	—32	70	—23	——	Ditto		
8	52	45	55	40	NE	Ditto		
9	52	38	72	29	E	Little		
10	62	33	93	25	——	Ditto		
11	63	35	97	28	——	Ditto		
12	62	37	83	30	——	Ditto		
13	61	41	83	31	——	Ditto		
14	60	45	65	43	SW	Ditto	.10	
15	68	45	83	36	S	Ditto		
16	67	52	93	45	——	Brisk	.17	
17	72	52	85	49	SW	Ditto	.58	
18	67	53	90	48	——	Ditto		
19	73	54	103	48	——	Ditto		
20	75	45	101	35	SE	Ditto		
21	+81	49	+113	44	——	Little		
22	72	50	84	45	——	Ditto	.10	
23	67	50	83	48	S	Ditto	.15	
24	62	42	81	35	——	Ditto	.13	
25	63	45	83	37	SW	Ditto	.23	
26	67	46	89	39	——	Brisk	.03	
27	68	52	84	49	——	Ditto	.02	
28	67	53	83	46	——	Ditto		
29	66	51	85	48	W	Strong		
30	71	56	94	50	SW	Little		
31	68	48	82	42	S	Strong		
	66	46.6	85	40.5			2.24	

Mean Pressure from the 3 daily observations 29.813 inches.
—— Temperature.....Ditto..... 57°.6
—— Dew Point.....Ditto ..... 52°9
—— Degree of Dryness.Ditto ..... 4°.7
—— Degree of Moisture Ditto ..... 842°
—— Force of Vapour ..Ditto ..... 0.428 inch.
Least observed degree of Moisture..... 508°
Maximum Temperature in Shade ..... 81°
Minimum Temperature in ditto..... 32°
Maximum Temperature in the Sun..... 113°
Minimum of Terrestrial Radiation..... 23°

WINDS.

North.....	0 days.	N. East....	1 days.
East	5	S. East.....5	
South	6	S. West 13	
West.....	1	N. West....	0

31 days.

Amount of Rain ..... 2.24 inches.

JUNE.

1827		Morning.					Noon.					Night.				
	Days.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.
F.	1	29.740	56	56	—	Wet	29.726	63	56	7	Showery	29.949	55	51	4	Very Fine
☽ S.	2	—.888	53	53	—	Ditto	—.617	59	59	—	Ditto	—.621	52	48	4	Ditto
S.	3	—.885	60	51	9	Very Fine	—.900	66	44	22	Very Fine	—.928	56	50	6	Ditto
M.	4	—.936	55	50	5	Ditto	—.940	65	52	13	Ditto	30.005	53	51	2	Ditto
T.	5	—.887	60	56	4	Ditto	—.734	55	55	—	Wet	29.647	53	53	—	Showery
W.	6	—.671	53	50	3	Cloudy	—.698	57	54	3	Hail Showers	—.912	52	50	2	Fine
Th.	7	—.994	54	49	5	Ditto	30.038	65	51	14	Very Fine	30.130	60	56	4	Very Fine
F.	8	30.225	55	50	5	Very Fine	—.261	67	47	20	Ditto	—.352	55	50	5	Ditto
○ S.	9	—.354	59	54	5	Ditto	—.329	70	62	8	Sultry	—.443	60	54	6	Ditto
S.	10	—.323	62	59	3	Ditto	—.301	71	61	10	Cloudy	—.266	60	54	6	Ditto
M.	11	—.222	60	53	7	Ditto	—.204	71	58	13	Very Fine	—.198	59	54	5	Ditto
Tu.	12	—.151	62	58	4	Ditto	—.149	75	56	19	Ditto	—.189	58	55	3	Ditto
W.	13	—.142	60	53	7	Ditto	—.130	73	53	20	Ditto	—.076	65	60	5	Ditto
Th.	14	29.964	62	59	3	Ditto	29.885	75	62	13	Ditto	29.816	65	60	5	Ditto
F.	15	—.767	62	60	2	Hazy	—.756	70	61	9	Fine	—.751	62	60	2	Ditto
☾ S.	16	—.743	62	60	2	Cloudy	—.747	64	62	2	Showery	—.784	60	57	3	Fine
S.	17	—.818	65	61	4	Very Fine	—.842	76	64	12	Cloudy	—.939	63	60	3	Very Fine
M.	18	—.998	62	56	6	Ditto	—996	72	60	12	Very Fine	—.976	65	61	4	Ditto
T.	19	—.968	62	57	5	Ditto	—.940	67	57	10	Cloudy	—.844	60	56	4	Cloudy
W.	20	—.860	61	57	4	Ditto	—.895	65	54	11	Very Fine	—.920	56	53	3	Fine
Th.	21	—.918	57	54	3	Ditto	—.925	67	45	22	Ditto	—.990	54	52	2	Ditto
F.	22	30.036	56	52	4	Ditto	30.057	65	52	13	Ditto	30.115	57	51	6	Ditto
S.	23	*														
S.	24	30.117	61	54	7	Very Fine	30.121	78	54	24	Very Fine	30.135	59	55	4	Very Fine
● M.	25	—.137	59	51	8	Ditto	—.129	77	55	22	Ditto	— 107	58	53	5	Ditto
T.	26	—.081	62	55	7	Ditto	—.073	76	49	27	Ditto	—.063	64	55	9	Ditto
W.	27	29.981	60	59	1	Cloudy	29.877	70	60	10	Cloudy	29.828	60	58	2	Cloudy
Th.	28	—.673	60	60	—	Wet	—.683	63	63	—	Wet	—.715	60	60	—	Ditto
F.	29	—.652	62	62	—	Ditto	—.714	67	61	6	Cloudy	—.757	63	56	7	Ditto
S.	30	—.804	62	60	2	Cloudy	— 836	70	55	15	Very Fine	—.920	60	54	6	Ditto
		29.963	59	55	4		29.948	68.2	55.9	12.3		29.978	58	54	4	

* The Means are calculated for 29 days only, as no observations were made upon the 23rd.

JUNE.

Days.	Temperature.				Wind.		Rain.		Remarks.
	Max.	Min.	Sun.	Rad.	Direction.	Force.	In.	Pts.	
1	66	48	87	38	S	Strong		.10	The weather at the beginning of this was similar to that of the preceding month, but as it advanced it became warmer and more seasonable. The temperature at night during the whole month was unusually low, and particularly so on the 7th, 8th, and 20th. Some Thunder showers fell on the 20th and 21st; that of the 21st was very heavy, accompanied with hail.
2	61	43	86	37	W	Brisk		.04	
3	67	45	91	38	SW	Little			
4	66	46	98	39	——	Brisk			
5	60	45	62	40	W	Ditto		.11	
6	59	45	81	36	NW	Ditto		.09	
7	65	—38	87	—30	——	Ditto			
8	72	41	97	33	W	Little			
9	73	50	102	42	SE	Ditto			
10	72	47	98	41	NE	Strong			
11	74	48	97	40	——	Brisk			
12	76	49	99	43	——	Ditto			
13	73	50	96	46	E	Ditto			
14	77	55	102	51	——	Ditto			
15	71	55	90	50	NW	Ditto			
16	70	57	91	54	S	Little			
17	78	54	100	48	——	Ditto			
18	73	51	102	46	——	Ditto			
19	68	54	89	48	SW	Brisk		.02	
20	67	42	90	33	——	Ditto		.03	
21	67	44	93	36	——	Ditto		.13	
22	68	49	102	40	W	Little			
23	*								
24	+79	46	100	38	E	Little			
25	77	44	96	35	NE	Ditto			
26	78	52	+105	47	——	Ditto			
27	72	56	80	48	SW	Ditto			
28	64	57	66	55	S	Ditto		.30	
29	70	54	91	51	SW	Ditto			
30	73	55	98	51	——	Ditto			
	70.2	49	92.2	42			0.82		

Mean Pressure from the 3 daily observations 29.963 inches.
—— Temperature..... Ditto..... 61°.7
—— Dew Point..... Ditto..... 54°.9
—— Degree of Dryness. Ditto..... 6°.8
—— Degree of Moisture Ditto.....797°
—— Force of Vapour.. Ditto..... 0.460 inch.
Least observed degree of Moisture..... 414°
Maximum Temperature in Shade..... 79°
Minimum Temperature in ditto ..... 38°
Maximum Temperature in the Sun ..... 105°
Minimum of Terrestrial Radiation ..... 30°.

WINDS.

North.....0 days	N. East.....5 days
East 3	S. East.....1
South 5	S. West.....8
West 4	N. West..... 3

29 days.

Amount of Rain.....0.82 inch.

* The Means are calculated for 29 days only, as no observations were made upon the 23rd.

JULY.

1827.		Morning.					Noon.					Night.				
	Days.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.
S.	1	29.739	67	62	5	Cloudy	29.763	71	63	8	Showery	29.917	60	59	1	Cloudy
☽ M.	2	—.840	60	60	—	Wet	—.816	68	64	4	Cloudy	—.832	58	57	1	Ditto
Tu.	3	—.866	62	60	2	Cloudy	—.934	69	51	18	Very Fine	30.067	62	53	9	Fine
W.	4	30.234	63	58	5	Very Fine.	30.212	71	55	16	Ditto	—.163	62	62	—	Wet
Th.	5	—.227	62	60	2	Cloudy	—.332	72	58	14	Ditto	—.447	58	54	4	Very Fine
F,	6	—.475	62	58	4	Thick Fog	—.466	77	55	22	Ditto	—.452	60	54	6	Ditto
S.	7	—.434	63	59	4	Very Fine	—.362	77	61	16	Ditto	—.416	70	61	9	Ditto
○ S.	8	—.424	68	59	9	Ditto	—.426	81	60	21	Ditto	—.390	70	59	11	Ditto
M.	9	—.335	70	65	5	Ditto	—.243	79	57	22	Ditto	—.228	69	59	10	Ditto
Tu.	10	—.195	66	58	8	Ditto	—.138	76	59	17	Ditto	—.046	62	55	7	Ditto
W.	11	—.050	64	61	3	Cloudy	—.224	77	55	22	Ditto	—.134	67	53	14	Ditto
Th.	12	—.161	60	51	9	Very Fine	—.205	73	50	23	Ditto	—.251	65	53	12	Ditto
F.	13	— 225	65	57	8	Ditto	—.223	80	55	25	Ditto	—.214	68	53	15	Ditto
S.	14	—.201	62	50	12	Ditto	—.175	76	53	23	Ditto	—.114	64	55	9	Ditto
☾ S.	15	—.064	65	59	6	Ditto	—.062	72	52	20	Ditto	—.078	65	54	11	Ditto
M.	16	—.165	62	53	9	Ditto	—.112	77	53	24	Ditto	—.072	64	54	10	Ditto
Tu.	17	—.084	63	53	10	Ditto	—.052	81	54	27	Ditto	—.050	67	60	7	Ditto
W.	18	—.014	65	63	2	Cloudy	—.016	77	55	22	Ditto	—.056	63	59	4	Ditto
Th	19	—.042	62	60	2	Ditto	29.978	67	60	7	Cloudy	29.886	64	64	—	Heavy Rain
F.	20	29.755	60	59	1	Ditto	—.788	71	57	14	Very Fine	—.840	63	60	3	Very Fine
S.	21	—.943	59	52	7	Fine	—.972	69	55	14	Ditto	30.034	63	57	6	Ditto
S.	22	30.058	65	62	3	Cloudy—Wet	30.024	67	67	—	Wet	29.980	62	62	—	Wet
M.	23	—.044	64	63	1	Sultry	—.050	75	70	5	Cloudy	30.098	70	68	2	Fine
● Tu.	24	—.110	66	63	3	Cloudy	—.100	76	66	10	Ditto	—.076	72	65	7	Very Fine
W.	25	29.988	66	63	3	Ditto	—.016	73	70	3	Showery	—.046	65	57	8	Ditto
Th.	26	30.157	62	55	7	Very Fine	—.112	70	50	20	Very Fine	29.899	62	62	—	Heavy Rain
F.	27	—.129	62	57	5	Ditto	—.192	72	62	10	Ditto	30.179	69	67	2	Cloudy
S.	28	—.225	71	67	4	Cloudy	—.220	77	65	12	Ditto	—.236	70	65	5	Very Fine
S.	29	—.212	69	65	4	Very Fine	—.145	83	65	18	Ditto	—.009	73	62	11	Sultry
M.	30	29.798	75	71	4	Sultry—Fine	29.946	75	54	21	Ditto	—0 98	66	57	9	Ditto
☽ T.	31	30.260	63	58	5	Very Fine	30.383	75	49	26	Ditto	—.275	64	58	6	Very Fine
		30.111	64.2	59.3	4.9		30.118	74	58	16		30.116	65	58.6	6.4	

JULY.

Days.	Temperature.				Wind.		Rain.	Remarks.
	Max.	Min.	Sun.	Rad.	Direction.	Force.	In. Pts.	
1	72	54	91	52	W	Brisk	.38]	
2	71	52	93	48	SW	Ditto		
3	72	56	95	51	W	Strong		
4	75	58	99	55	——	Brisk	.05	
5	73	44	101	37	——	Little		
6	82	51	109	44	NW	Ditto		
7	84	55	112	48	SE	Ditto		
8	82	57	107	49	NW	Ditto		
9	84	54	112	47	——	Ditto		
10	79	55	110	50	SW	Brisk		
11	81	45	114	37	NW	Little		
12	86	49	+118	41	——	Ditto		
13	82	50	117	41	E	Ditto		
14	76	46	98	39	——	Ditto		
15	78	51	104	45	——	Ditto		
16	79	—44	111	—34	NE	Ditto		
17	85	50	118	43	SE	Ditto		
18	79	52	105	45	S	Brisk		
19	68	60	72	59	——	Little	.42	
20	72	52	108	45	SW	Brisk		
21	69	44	92	36	——	Little		
22	67	56	70	54	S	Ditto	.20	
23	79	61	97	55	SW	Ditto		
24	76	63	95	58	——	Ditto		
25	75	50	92	43	W	Ditto	.05	
26	71	60	90	58	——	Ditto	.21	
27	79	61	94	57	SW	Ditto		
28	81	52	91	47	——	Brisk		
29	+89	65	110	57	——	Ditto		
30	79	51	102	43	W	Stormy		
31	77	50	101	41	——	Brisk		
	77·5	53	100	47			1.31	

The weather during the whole of this month was remarkably fine and pleasant. The rain which fell upon the 1st, 19th, 22nd, and 26th, was very beneficial; but the total amount for the month is much below the average mean. Some thunder was heard on the 19th, 25th, and 29th; during the night of the latter the lightning was particularly vivid and frequent.

Mean Pressure from the 3 daily observations 30.115 inches.
—— Temperature.....Ditto..... 67°.7
—— Dew Point.....Ditto..... 58°.6
—— Degree of Dryness.Ditto..... 9°.1
—— Degree of Moisture Ditto..... 752°
—— Force of Vapour.. Ditto..... 0.526 inch.
Least observed degree of Moisture ..... 420°
Maximum Temperature in Shade..... 89°
Minimum Temperature in ditto..... 44°
Maximum Temperature in the Sun ..... 118°
Minimum of Terrestrial Radiation ..... 34°

WINDS.

North.....0 days.	N. East ....1 days.
East 3	S. East.....2
South 3	S. West 9
West 8	N. West....5

31 days.

Amount of Rain ..... 1.31 inch.

AUGUST.

1826.		Morning.					Noon.					Night.				
	Days.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.
W.	1	30.180	63	55	8	Very Fine	30.106	75	55	20	Very Fine	30.060	68	57	11	Very Fine
Th.	2	29.947	62	55	7	Ditto	29.894	85	59	26	Ditto	29.862	67	59	8	Ditto
F.	3	—.860	63	54	9	Ditto	—.864	74	57	17	Ditto	—.666	65	60	5	Ditto
S.	4	—.677	65	62	3	Cloudy	—.782	74	61	13	Ditto	—.899	66	60	6	Ditto
S.	5	30.056	64	57	7	Very Fine	30.120	75	51	24	Ditto	30.148	68	64	4	Cloudy
M.	6	—.310	63	61	2	Cloudy	—.322	67	59	8	Cloudy	—.317	59	52	7	Very Fine
○ T.	7	—.323	58	54	4	Very Fine	—.301	73	60	13	Fine	—.228	63	59	4	Ditto
W.	8	—.187	59	52	7	Ditto	—.172	72	51	21	Ditto	—.112	57	52	5	Ditto
Th.	9	—.162	61	58	3	Ditto	—.027	73	50	23	Very Fine	29.956	65	57	8	Ditto
F.	10	29.721	65	62	3	Sultry	29.679	76	55	21	Ditto	—.652	60	54	6	Fine
S.	11	—.618	60	55	5	Very Fine	—.612	65	59	6	ThunderShoʳˢ.	—.645	57	56	1	Ditto
S.	12	—.738	61	57	4	Ditto	—.752	66	47	19	Very Fine	—.903	57	50	7	Ditto
M.	13	—.947	57	51	6	Ditto	—.943	69	57	12	Cloudy	—.814	60	60	—	Wet
☾ T.	14	—.709	65	65	—	Cloudy	—.673	68	64	4	Ditto	—.570	66	65	1	Cloudy
W.	15	—.363	65	64	1	Showery	—.420	71	60	11	Fine	—.463	66	62	4	Fine
Th.	16	—.395	62	61	1	Foggy	—.633	61	61	—	Wet	—.566	60	60	—	Wet
F.	17	—.741	62	61	1	Ditto	—.846	68	58	10	Showery	—.879	61	61	—	Ditto
S.	18	30.019	65	63	2	Cloudy	30.033	73	60	13	Fine	30.041	60	59	1	Cloudy
S.	19	—.079	58	55	3	Fine	—.021	68	53	15	Ditto	—.109	59	57	2	Very Fine
M.	20	—.081	57	55	2	Very Fine	—.079	64	58	6	Cloudy	—.075	60	59	1	Fine
T.	21	—.087	58	54	4	Ditto	—.073	64	64	—	ThunderShoʳˢ.	—.112	62	60	2	Cloudy
● W.	22	—.156	57	54	3	Cloudy	—.205	62	54	8	Cloudy	—.280	57	52	5	Ditto
Th.	23	—.340	57	54	3	Ditto	—.367	67	53	14	Very Fine	—.359	64	62	2	Very Fine
F.	24	—.281	60	58	2	Very Fine	—.268	65	60	5	Ditto	—.178	58	55	3	Ditto
S.	25	—.138	56	51	5	Ditto	—.178	62	50	12	Stormy	—.190	55	50	5	Cloudy
S.	26	—.190	56	48	8	Cloudy	—.214	61	61	—	Showery	—.230	56	54	2	Ditto
M.	27	—.332	55	52	3	Very Fine	—.330	75	58	17	Very Fine	—.322	61	57	4	Very Fine
T.	28	—.311	61	56	5	Ditto	—.313	68	54	14	Ditto	—.427	57	55	2	Ditto
☽ W.	29	—.452	56	48	8	Ditto	—.426	67	50	17	Ditto	—.405	57	55	2	Ditto
Th.	30	—.340	54	52	2	Cloudy	—.236	64	60	4	Dull & Cloudy	—.208	62	61	1	Cloudy
F.	31	—.301	58	54	4	Very fine.	—.345	68	51	17	Very Fine	—.371	57	53	4	Very Fine
		30.030	60	56	2.6		30.040	69	56.4	12.6		30.033	60.9	57.3	3.6	

AUGUST.

Days.	Temperature.				Wind.		Rain.	
	Max.	Min.	Sun.	Rad.	Direction.	Force.	In.	Pts.
1	84	45	+112	35	W	Little		
2	+86	60	110	54	S	Ditto		
3	75	59	91	54	——	Brisk		.05
4	76	58	101	51	SW	Ditto		
5	79	64	104	57	S	Little		.23
6	68	47	92	37	SE	Ditto		
7	74	—42	101	—32	S	Ditto		
8	73	44	96	35	——	Ditto		
9	81	52	111	45	——	Ditto		
10	76	50	101	43	SW	Brisk		.05
11	69	51	93	37	W	Ditto		.11
12	70	45	98	38	——	Ditto		
13	69	55	90	53	——	Ditto		.04
14	69	60	78	57	——	Ditto		
15	71	53	86	46	S	Ditto		.13
16	64	52	84	48	SW	Ditto		.31
17	73	54	91	49	S	Little		.12
18	73	51	96	46	SE	Ditto		
19	69	49	90	41	——	Ditto		
20	66	46	110	40	E	Ditto		
21	65	52	91	50	NE	Brisk		.62
22	63	51	68	46	——	Ditto		
23	69	51	100	44	W	Little		
24	67	48	79	41	NW	Brisk		
25	62	49	76	40	N	Ditto		
26	63	42	79	34	NW	Strong		
27	75	52	106	46	——	Brisk		
28	70	45	92	35	——	Ditto		
29	70	45	105	37	——	Little		
30	65	50	72	45	——	Ditto		
31	68	52	79	46	NE	Ditto		
	71	50.7	93	44			1.66	

Remarks.

The mean temperature of this month was considerably below that of last year. At the commencement the weather was generally clear and fine in the day time, but unusually cold at nights. Some heavy thunder accompanied the rain on the 16th, 17th, and 21st. Towards the latter part of the month the weather was more favourable and the Barometer high.

Mean Pressure from the 3 daily observations 30.034 inches.
—— Temperature .....Ditto..... 63°.3
—— Dew Point .....Ditto..... 56°.6
—— Degree of Dryness..Ditto..... 6°.7
—— Degree of Moisture Ditto..... 800°
—— Force of Vapour..Ditto..... 0.492 inch.
Least observed degree of Moisture..... 440°
Maximum Temperature in Shade ..... 86°
Minimum Temperature in ditto..... 42°
Maximum Temperature in the Sun ..... 112°
Minimum of Terrestrial Radiation..... 32°

Winds.

North.....	1 days.	N. East.....	3 days.
East.....	1	S. East.....	3
South.....	8	S. West.....	3
West.....	6	N. West	6

31 days.

Amount of Rain.....1.66 inch.

SEPTEMBER.

1827.		Morning.					Noon.					Night.				
	Days.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.
S.	1	30.394	60	56	4	Very Fine	30.365	71	55	16	Very Fine	30.369	57	55	2	Very Fine
S.	2	—.358	61	59	2	Ditto	—.350	71	58	13	Ditto	—.298	60	56	4	Ditto
M.	3	—.306	55	53	2	Ditto	—.326	68	51	17	Ditto	—.347	61	56	5	Ditto
Tu.	4	—.357	57	52	5	Cloudy	—.319	64	54	10	Cloudy	—.297	56	53	3	Cloudy
○ W.	5	—.258	56	52	4	Ditto	—.262	68	60	8	Fine	—.279	55	53	2	Very Fine
Th.	6	—.281	52	50	2	Ditto	—.309	69	53	16	Very Fine	—.339	55	52	3	Ditto
F.	7	—.320	50	46	4	Ditto	—.301	65	54	11	Cloudy	—.281	58	55	3	Cloudy
S.	8	—.279	52	49	3	Ditto	—.281	64	50	14	Hazy	—.200	58	55	3	Ditto
S.	9	—.025	64	59	5	Ditto	—.003	68	68	—	Wet	29.937	59	59	—	Wet
M.	10	29.909	59	59	—	Rainy	29.911	66	66	—	Ditto	—.917	66	66	—	Cloudy
Tu.	11	—.860	64	62	2	Cloudy	—.792	70	65	5	Very Fine	—.753	60	60	—	Wet
W.	12	—.729	58	58	—	Showery	—.774	62	62	—	Showery	—.800	55	54	1	Cloudy
☾ Th.	13	—.907	55	53	2	Fine	30.042	65	60	5	Ditto	30.174	53	52	1	Fine
F.	14	30.208	52	48	4	Very Fine	—.224	66	58	8	Very Fine	—.222	60	59	1	Cloudy
S.	15	—.266	56	53	3	Ditto	—.301	67	61	6	Ditto	—.314	65	63	2	Ditto
S.	16	—.336	65	63	2	Cloudy	—.338	69	61	8	Cloudy	—.331	64	62	2	Ditto
M.	17	—.340	64	59	3	Very Fine	—.336	70	64	6	Very Fine	—.314	60	59	1	Ditto
Tu.	18	—.287	62	60	2	Ditto	—.220	68	62	6	Fine	—.246	56	56	—	Ditto
W.	19	—.190	51	46	5	Fine	—.224	60	42	18	Ditto	—.189	51	45	6	Ditto
Th.	20	29.816	47	47	—	Rainy	29.844	57	52	5	Cloudy	29.947	51	50	1	Ditto
● F.	21	—.848	53	51	2	Very Fine	—.828	63	60	3	Showery	—.654	58	58	—	Wet
S.	22	—.543	55	54	1	Fine	—.513	64	61	3	Ditto	—.543	50	49	1	Clear
S.	23	—.557	58	58	—	Showery	—.590	62	60	2	Ditto	—.650	50	49	1	Ditto
M.	24	—.691	50	50	—	Ditto	—.695	63	60	3	Ditto	—.707	52	52	—	Cloudy
Tu.	25	—.717	53	51	2	Fine	—.695	64	58	6	Cloudy	—.670	57	55	2	Fine
W.	26	—.628	56	56	—	Very Fine	—.594	71	64	7	Fine	—.628	60	60	—	Heavy Rain
Th.	27	—.642	62	62	—	Cloudy	—.687	70	64	6	Ditto	—.755	57	57	—	Hazy
☽ F.	28	—.747	57	56	1	Fine	—.743	66	62	4	Fine	—.729	57	56	1	Fine
S.	29	—.660	56	56	—	Showery	—.652	62	62	—	Wet	—.820	57	57	—	Cloudy
S.	30	—.798	61	59	2	Hazy	—.796	67	58	9	Very Fine	—.800	55	54	1	Fn e
		30.008	56.7	54.6	2.1		30.010	66	58.8	7.2		30.017	57	55.5	1.5	

SEPTEMBER.

Days.	Temperature. Max.	Min.	Sun.	Rad.	Wind. Direction.	Force.	Rain. In.	Pts.
1	72	51	94	43	NE	Little		
2	72	59	98	46	——	Ditto		
3	71	53	+100	47	——	Ditto		
4	65	52	76	48	N	Brisk		
5	69	48	90	38	——	Little		
6	70	40	91	—32	NE	Ditto		
7	68	52	86	46	——	Ditto		
8	65	52	72	44	——	Ditto		
9	68	55	71	55	S	Ditto	1	09
10	67	55	67	54	——	Ditto		12
11	72	55	85	52	SW	Ditto		08
12	63	54	65	51	——	Ditto		38
13	67	—41	90	34	NW	Ditto		
14	66	54	87	51	W	Ditto		
15	70	59	96	55	NW	Ditto		03
16	70	58	84	54	N	Ditto		
17	+72	54	98	47	NW	Ditto		
18	70	43	99	35	W	Ditto		
19	61	45	89	40	NW	Brisk		36
20	60	43	76	35	W	Ditto		
21	65	52	77	49	NW	Little		10
22	64	43	80	36	——	Brisk		20
23	63	43	80	35	W	Little		38
24	64	48	89	42	SW	Ditto		07
25	65	48	78	41	——	Ditto		
26	72	55	90	53	SE	Ditto		43
27	71	54	91	50	——	Ditto		
28	67	51	80	46	——	Ditto		
29	65	52	80	50	——	Ditto		13
30	70	51	87	46	S	Ditto		
	67.7	50.6	84.8	45.			3.37	

Remarks.

The general character of this period may be considered as having been more unseasonable and wet than that of former years. The winds were for the most part Northerly. The quantity of rain which fell is ¾ of an inch more than the average mean of the month.

Mean Pressure from the 3 daily observations 30.011 inches.
—— Temperature.....Ditto..... 59°.9
—— Dew Point .....Ditto..... 56°.3
—— Degree of Dryness.Ditto ..... 3°.6
—— Degree of Moisture Ditto..... 906°
—— Force of Vapour...Ditto..... 0.492 inch.
Least observed degree of Moisture..... 439°
Maximum Temperature in Shade ..... 72°
Minimum Temperature in ditto ..... 41°
Maximum Temperature in the Sun..... 100°
Minimum of Terrestrial Radiation ..... 32°

WINDS.

North 3	days	N. East 6	days.
East.....0		S. East.....4	
South.....3		S. West 4	
West 4		N. West ...6	

30 days.

Amount of Rain..... 3.37 inches.

OCTOBER.

1827.		Morning.					Noon.					Night.				
	Days.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.
M.	1	29.806	55	55	—	Foggy	29.804	60	60	—	Heavy Rain	29.848	57	57	—	Dense Fog
Tu.	2	—.915	56	56	—	Dense Fog	—.946	65	60	5	Very Fine	30.075	52	51	1	Foggy
W.	3	30.231	53	52	1	Fine	30.269	62	58	4	Ditto	—.350	49	49	—	Slight Fog
T.	4	—.405	49	48	1	Cloudy	—.411	64	57	7	Ditto	—.549	50	49	1	Very Fine
○ F.	5	—.417	53	52	1	Ditto	—.348	64	59	5	Ditto	—.336	54	53	1	Ditto
S.	6	—.191	49	49	—	Heavy Fog	—.078	63	57	6	Ditto	—.052	48	46	2	Ditto
S.	7	29.985	48	48	—	Ditto	29.902	62	54	8	Ditto	29.841	47	47	—	Thick Fog.
M.	8	—.704	48	46	2	Very Fine	—.605	63	58	5	Cloudy	—.438	52	52	—	Showery
Tu.	9	—.297	56	56	—	Showery	—.274	62	60	2	Showery	—.313	56	56	—	Wet
W.	10	—.377	54	54	—	Ditto	—.371	56	56	—	Rainy	—.022	49	49	—	Heavy Rain
T.	11	—.264	48	48	—	Wet	—.280	55	49	6	Showery	—.288	48	46	2	Clear
F.	12	—.381	51	47	4	Fine	—.469	57	51	6	Cloudy	—.559	45	42	3	Ditto
☾ S.	13	—.559	36	36	—	Dense Fog	—.487	53	45	8	Very Fine	—.534	42	40	2	Ditto & Cold
S.	14	—.766	48	46	2	Cloudy	—.791	57	48	9	Fine	—.869	47	47	—	Cloudy
M.	15	—.912	49	47	2	Fine	—.959	65	60	5	Very Fine	—.963	55	55	—	Ditto
Tu.	16	—.992	60	59	1	Cloudy	—.986	63	61	2	Ditto	—.938	50	49	1	Fine
W.	17	—.902	52	51	1	Fine	—.873	61	54	7	Ditto	—.949	46	45	1	Clear
T.	18	—.793	50	50	—	Foggy	—.768	64	60	4	Ditto	—.758	56	56	—	Foggy
F.	19	—.758	52	52	—	Wet	—.799	63	57	6	Showery	—.807	57	57	—	Wet
● S.	20	—.769	54	54	—	Showery	—.733	63	60	3	Ditto	—.695	57	56	1	Cloudy
S.	21	—.596	58	57	1	Fine	—.580	63	57	6	Fine	—.529	56	56	—	Ditto
M.	22	—.355	55	55	—	Showery	—.285	61	58	3	Ditto	—.125	55	55	—	Ditto
Tu.	23	—.179	55	55	—	Wet	—.256	62	60	2	Showery	—.363	52	52	—	Showery
W.	24	—.635	51	51	—	Foggy	—.768	60	57	3	Cloudy	—.981	51	51	—	Wet
T.	25	30.090	55	55	—	Wet	30.094	59	59	—	Wet	30.140	57	57	—	Ditto
F.	26	—.128	54	53	1	Cloudy	—.102	62	56	6	Fine	29.977	53	52	1	Cloudy
☽ S.	27	29.758	52	51	1	Fine	29.699	62	60	2	Cloudy	—.528	56	56	—	Wet
S.	28	—.514	45	45	—	Heavy Rain	—.641	46	46	—	Heavy Rain	—.910	40	40	—	Ditto
M.	29	—.844	36	35	1	Clear & Cold	—.982	50	45	5	Fine	30.055	40	39	1	Clear & Cold
Tu.	30	—.968	36	36	—	Thick Fog	—.922	50	48	2	Cloudy	29.772	48	47	1	Ditto
W.	31	—.756	46	45	1	Fine	—.754	52	46	6	Fine	29.851	45	38	7	Ditto
		29.782	50.4	49.8	.6		29.781	59.6	55.3	4.3		29.755	50.6	49.8	.8	

OCTOBER.

Days.	Temperature.				Wind.		Rain.	
	Max.	Min.	Sun.	Rad.	Direction.	Force.	In. Pts.	Remarks.
1	61	53	71	48	SE	Little	.45	
2	67	54	+93	47	S	Ditto		During the whole of this month the weather was particularly mild, but cloudy and wet, excepting a few days in the beginning and towards the middle of the month, which were very pleasant. A heavy thunder storm passed over the metropolis on the night of the 10th, or rather on the morning of the 11th, which in some places to the eastward of London did considerable damage.
3	63	44	75	37	——	Ditto		
4	65	44	90	36	E	Ditto		
5	+67	42	87	34	SE	Ditto		
6	64	40	83	32	——	Ditto		
7	63	42	82	36	E	Ditto		
8	63	48	75	40	SE	Ditto	.20	
9	63	52	71	48	E	Brisk	.14	
10	59	46	62	41	S	Boisterous	.68	
11	56	45	58	40	SW	Brisk	.08	
12	58	31	70	25	W	Ditto		
13	54	38	81	31	——	Ditto		
14	58	45	87	40	——	Little		
15	65	53	78	46	——	Ditto		
16	64	48	72	42	SW	Ditto		
17	63	40	87	32	W	Ditto		
18	66	49	89	45	——	Ditto		
19	65	50	88	50	SE	Ditto	.60	
20	64	52	80	49	——	Brisk		
21	64	51	81	47	——	Ditto		
22	61	51	74	50	E	Little	.47	
23	62	49	74	41	SE	Ditto		
24	61	48	70	42	S	Ditto	.06	
25	60	46	62	42	SE	Ditto	.14	
26	63	48	75	43	——	Ditto		
27	62	44	70	40	E	Brisk	.18	
28	46	32	46	25	NE	Ditto	1.06	
29	50	—31	73	—24	——	Little		
30	52	44	68	40	N	Ditto		
31	52	34	68	27	NW	Brisk		
	60.7	45	75.4	39.3			4.06	

Mean Pressure from the 3 daily observations 29.772 inches.
—— Temperature.....Ditto..... 53°.5
—— Dew Point .....Ditto..... 51°.6
—— Degree of Dryness.Ditto..... 1°.9
—— Degree of Moisture.Ditto ..... 932°
—— Force of Vapour...Ditto..... 0.414 inch.
Least observed degree of Moisture ..... 774°
Maximum Temperature in Shade ..... 67°
Minimum Temperature in ditto ..... 31°
Maximum Temperature in the Sun ..... 93°
Minimum of Terrestrial Radiation ..... 24°

WINDS.

North	1 days.	N. East.....	2 days.
East.....	5	S. East.....	10
South	4	S. West.....	2
West	6	N. West ..	1

31 days.

Amount of Rain ..... 4.06 inches.

NOVEMBER.

1827.		Morning.					Noon.					Night.				
	Days.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.
Th.	1	30.046	38	32	6	Clear and Cold	30.086	50	42	8	Fine	29.985	42	38	4	Clear
F.	2	29.982	42	40	2	Ditto	—.011	50	40	10	Ditto	30.127	42	38	4	Ditto
○ S.	3	30.180	39	39	—	Foggy.	—.150	52	48	4	Cloudy	—.174	49	48	1	Fine
S.	4	—.189	48	47	1	Cloudy	—.244	55	52	3	Ditto	—.264	50	49	1	Ditto
M.	5	—.393	48	48	—	Slight Fog	—.406	60	54	6	Fine	—.391	42	41	1	Clear & Cold
T.	6	—.375	50	50	—	Ditto	—.345	56	52	4	Ditto	—.248	50	50	—	Cloudy
W.	7	—.221	51	51	—	Ditto	—.226	52	52	—	Wet	—.200	48	48	—	Ditto
Th.	8	—.143	46	46	—	Ditto	—.113	51	51	—	Cloudy	29.910	49	49	—	Ditto
F.	9	29.926	50	50	—	Ditto	29.938	52	51	1	Ditto	—.946	48	48	—	Ditto
S.	10	—.841	48	48	—	Cloudy	—.981	50	48	2	Ditto	—.948	49	49	—	Ditto
☾ S.	11	30.043	49	48	1	Fine	30.057	57	53	4	Fine	30.073	45	43	2	Clear & Cold
M.	12	—.047	40	40	—	Foggy	—.191	50	43	7	Very Fine	—.208	46	46	—	Cloudy
T.	13	—.193	50	50	—	Ditto	—.185	60	58	2	Cloudy	—.150	56	56	—	Wet
W.	14	—.118	46	46	—	Wet	—.098	50	39	11	Clear & Fine	29.994	38	37	1	Fine
Th.	15	29.811	45	45	—	Ditto	29.730	52	48	4	Cold & Cloudy	—.597	40	40	—	Dense Fog
F.	16	—.467	46	46	—	Ditto	—.508	49	49	—	Wet	—.687	46	46	—	Ditto
S.	17	—.770	47	47	—	Cloudy	—.849	50	48	2	Cloudy	—.932	42	42	—	Ditto
S.	18	30.106	45	45	—	Dense Fog	30.156	51	51	—	Dense Fog	—.995	47	47	—	Wet
● M.	19	—.281	50	50	—	Ditto	—.279	52	52	—	Foggy	30.269	49	49	—	Cloudy
T.	20	—.196	45	45	—	Ditto	—.182	48	47	1	Hazy	—.126	46	46	—	Ditto
W.	21	—.263	42	38	4	Clear & Cold	—.196	42	39	3	Fine	—.054	32	29	3	Clear & Cold
Th.	22	29.964	25	19	6	Ditto	29.877	34	30	4	Ditto	29.827	29	28	1	Ditto
F.	23	—.758	24	20	4	Ditto	—.665	34	32	2	Cloudy	—.693	34	33	1	Ditto
S.	24	—.738	28	26	2	Ditto	—.927	34	30	4	Fine	30.075	27	25	2	Ditto
☽ S.	25	30.020	36	36	—	Drizzly	30.147	38	38	—	Foggy	—.193	36	36	—	Foggy
M.	26	—.355	37	37	—	Foggy	—.401	44	43	1	Ditto	—.435	41	41	—	Ditto
T.	27	—.376	40	40	—	Dense Fog	—.364	46	43	3	Fine	—.267	37	36	1	Clear
W.	28	—.114	34	33	1	Fine	—.001	46	46	—	Cloudy	29.741	45	45	—	Cloudy
Th.	29	29.401	44	44	—	Cloudy	29.492	51	48	3	Fine	—.557	43	43	—	Ditto
F.	30	—.538	46	46	—	Ditto	—.534	50	48	2	Cloudy	—.386	46	46	—	Showery
		30.028	42.6	41.7	0.9		30.044	48.8	45.8	3.		30.015	43.1	42.4	0.7	

NOVEMBER.

Days.	Temperature.				Wind.		Rain.	Remarks.
	Max.	Min.	Sun.	Rad.	Direction.	Force.	In. Pts.	
1	51	38	70	32	NW	Brisk		The mildness of the weather during this month was remarkable until the 21st, when the thermometer sunk to 7° below freezing, and on the 22nd to 12° below the same point. During the night of the 22d, and on the morning of the 25th some snow fell to the depth of about half an inch, but vanished in the course of the succeeding days. Fogs were frequent; those on the 15th, 16th, 17th and 18th, were remarkably dense.
2	50	30	69	24	——	Ditto		
3	52	46	56	40	W	Little		
4	56	42	72	38	SW	Ditto		
5	60	49	69	44	——	Ditto		
6	56	45	+73	40	S	Ditto		
7	52	46	52	44	——	Ditto	.08	
8	51	42	58	34	SE	Ditto		
9	52	46	60	40	S	Ditto		
10	51	45	51	42	SW	Ditto		Mean Pressure from the 3 daily observations 30.029 inches.
11	59	34	65	29	W	Ditto		—— Temperature .....Ditto..... 44°.8
12	52	45	72	41	——	Ditto		—— Dew Point.....Ditto..... 43°.3
13	+60	45	62	43	NE	Ditto	.10	—— Degree of Dryness..Ditto..... 1°.5
14	50	34	59	30	SE	Brisk	.22	—— Force of Vapour...Ditto..... 0.316 inch.
15	52	32	58	29	——	Little	.06	—— Degree of Moisture Ditto..... 963°
16	49	44	49	43	——	Ditto	.12	Least observed degree of Moisture..... 680°
17	51	40	55	40	S	Ditto		Maximum Temperature in Shade ..... 60°
18	51	46	52	44	E	Ditto	.04	Minimum Temperature in ditto ..... 20°
19	52	44	52	43	——	Ditto		Maximum Temperature in the Sun ..... 73°
20	50	40	53	35	NW	Ditto		Minimum of Terrestrial Radiation ..... 11°
21	42	25	54	15	——	Brisk		
22	34	—20	40	—11	N	Little		
23	34	28	40	20	——	Brisk		
24	35	22	45	12	NW	Ditto		
25	38	34	38	30	W	Little		
26	45	29	57	25	SW	Ditto		
27	46	27	60	22	——	Ditto		
28	46	38	61	34	S	Brisk	.32	
29	51	40	63	38	——	Little		
30	51	44	58	40	W	Brisk	.12	
	49.3	38.	57.4	33.4			1.06	

WINDS.

North.....	2 days	N. East.....	1 days
East	2	S. East.....	4
South	6	S. West.....	5
West	5	N. West....	5

30 days.

Amount of Rain.....1.06 inch.

DECEMBER.

1827.		Morning.					Noon.					Night.				
	Days.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather.	Barom.	Hygrometer.			Weather
S.	1	29.104	47	47	—	Cloudy	29.056	52	49	3	Cloudy	29.042	49	49	—	Showery
S.	2	—.192	44	44	—	Showery	—.297	50	50	—	Showery	—.484	44	43	1	Clear
○ M.	3	—.728	46	46	—	Cloudy	—.807	50	46	4	Fine	—.845	44	44	—	Cloudy
Tu.	4	—.832	48	48	—	Showery	—.861	53	50	3	Clear	—.994	48	48	—	Ditto
W.	5	—.974	52	50	2	Clear	30.005	56	50	6	Ditto & Fine	—.948	46	46	—	Wet
T.	6	—.891	43	40	3	Fine	—.091	46	38	8	Ditto	30.224	39	35	4	Clear & Cold
F.	7	30.246	34	32	2	Frosty	—.252	50	46	4	Ditto	.011	46	46	—	Cloudy
S.	8	29.908	44	43	1	Fine	29.958	50	44	6	Very Fine	29.946	39	37	2	Clear
S.	9	—.940	28	27	1	Ditto	—.817	46	46	—	Cloudy	—.742	46	46	—	Wet
M.	10	—.639	51	51	—	Wet	—.542	54	54	—	Wet	—.420	52	52	—	Ditto
☾ Tu.	11	—.534	45	45	—	Fine	—.418	53	53	—	Showery	—.430	47	47	—	Ditto
W.	12	—.408	44	44	—	Foggy	—.359	47	47	—	Dense Fog	—.343	47	47	—	Ditto
T.	13	—.518	38	37	1	Clear & Fine	—.600	44	40	4	Fine	—.677	39	39	—	Stormy
F.	14	—.396	45	45	—	Wet	—.371	46	46	—	Wet & Stormy	—.538	40	40	—	Wet
S.	15	—.730	47	46	1	Cloudy	—.667	53	53	—	Showery	—.628	52	52	—	Ditto
S.	16	—.669	48	46	2	Fine	—.898	50	50	—	Ditto	—.970	42	42	—	Ditto
M.	17	30.245	36	35	1	Ditto	30.176	51	45	6	Very Fine	30.082	48	47	1	Cloudy
● Tu.	18	29.833	51	51	—	Wet	29.825	53	53	—	Stormy Rain	29.698	52	52	—	Stormy Rain
W.	19	—.619	54	54	—	Ditto&Stormy	—.597	54	54	—	Ditto	—.593	51	51	—	Ditto
T.	20	—.597	46	45	1	Fine	—.615	48	46	2	Fine	—.578	42	42	—	Ditto
F.	21	—.724	40	39	1	Ditto	—.694	45	41	4	Ditto	—.419	44	44	—	Cloudy
S.	22	—.479	45	45	—	Showery	—.486	50	48	2	Cloudy	—.530	50	50	—	Wet
S.	23	—.803	45	45	—	Ditto	—.998	47	41	6	Fine	30.067	42	42	—	Ditto
M.	24	—.863	50	50	—	Ditto	—.910	57	49	8	Ditto	—.029	42	41	1	Cloudy
☽ Tu.	25	30.421	42	40	2	Fine	30.441	58	51	7	Ditto	—.464	45	44	1	Fine
W.	26	—.516	47	46	1	Cloudy	—.520	50	50	—	Showery	—.568	49	48	1	Ditto
T.	27	—.578	42	42	—	Ditto	—.594	51	49	2	Fine	—.661	38	38	—	Cloudy
F.	28	—.722	32	32	—	Foggy	—.729	37	36	1	Hazy	—.664	35	35	—	Dense Fog
S.	29	—.604	32	32	—	Dense Fog	—.541	36	36	—	Dense Fog	—.479	31	31	—	Ditto
S.	30	—.400	37	37	—	Foggy	—.350	42	38	4	Fine	—.257	34	33	1	Fine
M.	31	29.963	35	34	1	Slight Fog	29.801	42	42	—	Cloudy	29.765	46	46	—	Stormy
		29.873	43.1	42.5	0.6		29.880	49	46.4	2.6		29.873	44.1	43 7	.4	

DECEMBER.

Days.	Temperature.				Wind.		Rain.	
	Max.	Min.	Sun.	Rad.	Direction,	Force.	In. Pts.	Remarks.
1	53	42	62	40	W	Strong		
2	50	44	54	41	N W	Little	.12	Weather mild, but extremely wet during the whole of
3	51	42	62	39	W	Ditto	.14	the month, and the quantity of rain which fell was about
4	53	48	60	45	——	Brisk	.02	an inch more than usual. The wind on the night of the
5	56	45	62	40	N W	Ditto	.04	7th, 10th, and 18th, was very boisterons, and the fog on
6	46	31	52	22	W	Strong		the 12th, and 29th, during the day-time particularly
7	50	44	61	40	——	Ditto	.02	dense. The Barometer on the 28th was higher than it
8	50	—27	60	—19	——	Little		had been at any period during the year.
9	47	44	52	43	——	Brisk	.08	
10	55	45	61	40	S W	Ditto		
11	53	40	53	40	S	Stormy	.62	Mean Pressure from the 3 daily observations 29.875 inches.
12	48	35	48	30	W	Ditto	.15	—— Temperature.....Ditto..... 45°.4
13	44	35	52	25	S W	Ditto	.06	—— Dew Point .....Ditto. ..... 44°.2
14	46	37	46	32	S	Ditto	.32	—— Degree of Dryness.Ditto..... 1°.2
15	53	40	53	34	——	Brisk	.26	—— Degree of Moisture Ditto..... 964°
16	51	35	60	28	W	Ditto	.09	—— Force of Vapour...Ditto..... 0.328 inch.
17	51	48	57	41	S W	Stormy	.12	Least observed degree of Moisture..... 763°
18	54	50	54	48	——	Ditto	.20	Maximum Temperature in Shade..... 58°
19	54	45	54	40	——	Ditto	.25	Minimum Temperature in ditto..... 27°
20	48	38	50	32	——	Brisk	.02	Maximum Temperature in the Sun..... 65°
21	45	42	51	38	S	Ditto	.06	Minimum of Terrestrial Radiation ..... 19°
22	50	42	53	40	N	Ditto	.36	
23	50	36	61	30	N W	Ditto	.03	WINDS.
24	57	40	65	38	——	Ditto	.10	
25	+58	42	64	37	——	Little		North ..... 1 days | N. East..... 0 days.
26	51	45	51	41	S W	Ditto	.02	East..... 0 | S. East 1
27	52	32	+65	25	S	Ditto		South ..... 5 | S. West 9
28	38	31	39	26	S E	Ditto		West ..... 10 | N. West.... 5
29	36	28	37	28	W	Ditto	.01	31 days.
30	42	33	42	25	S W	Ditto		
31	46	45	46	43	——	Strong		Amount of Rain..... 3.09 inches.
	49.6	39.7	54.4	35.1			3.09	

Monthly Mean Pressure, Temperature, and Dew Point, &c. of 1827; deduced from the Observations recorded in the preceding Journal.

1827. Months.	Pressure.								Temperature.											
	Max.	Min.	Med.	Range of Barom.	Mean at Morn.	Mean at Noon.	Mean at Night.	Mean of the three Observations.	In the Shade. Max.	In the Shade. Min.	In the Shade. Med.	Mean at Morn.	Mean at Noon.	Mean at Night	Mean. of the three Observs	In Sun's Rays. Max.	In Sun's Rays. Min.	Terrestrial Radiation. Max.	Terrestrial Radiation. Min.	Med. of Sun and Radn.
Jan. ..	30.403	29.226	29.814	1.777	29.910	29.897	29.927	29.911	53	12.	32.5	35.	39.6	35.1	36.5	62	32	44	5	35.7
Feb...	30.635	29.459	30.047	1.176	30.104	30.098	30.113	30.105	57	15	36.	31.6	39.3	32.2	34.3	71	36	45	4	39.0
March	30.563	28.881	29.722	1.682	29.726	29.769	29.750	29.748	60	27	43.5	43.7	50.9	43.2	45.9	76	53	45	17	47.7
April .	30.386	29.540	29.963	0.846	30.013	30.011	30.016	30.013	78	25	51.5	48.1	57.3	47.6	51.	105	51	45	17	54.5
May ..	30.193	29.212	29.702	0.981	29.826	29.805	29.808	29.813	81	32	56.5	55.7	64.4	52.7	57.6	113	55	50	23	60.2
June*.	30.354	29.617	29.985	0.737	29.963	29.948	29.978	29.963	79	38	58.5	59.	68.2	58.	61.7	105	62	55	30	63.
July ..	30.475	29.755	30.115	0.720	30.111	30.118	30.116	30.115	89	44	66.5	64.2	74.	65.	67.7	118	72	59	34	70.7
Aug. .	30.452	29.363	29.907	1.089	30.030	30.040	30.033	30.034	86	42	64.	60.	69.	60.9	63.3	112	68	57	32	67.2
Sept. .	30.394	29.513	29.953	0.881	30.008	30.010	30.017	30.011	72	41	56.5	56.7	66.	57.	59.9	100	65	55	32	63.
Oct. ..	30.549	29.022	29.835	1.527	29.782	29.781	29.755	29.772	67	31	49.	50.4	59.6	50.6	53.5	93	46	50	24	53.2
Nov...	30.435	29.401	29.918	1.034	30.028	30.044	30.015	30.029	60	20	40.	42.6	48.8	43.1	44.8	73	38	44	11	41.5
Dec...	30.729	29.042	29.885	1.687	29.873	29.880	29.873	29.875	58	27	42.5	43.1	49.	44.1	45.4	65	37	48	19	42.2
Aver.	30.464	29.336	29.900	1.128	29.947	29.950	29.950	29.949	70	29.5	49.7	49.1	57.1	49.1	51.8	91	51.2	49.7	20.6	53.1

* In June the Means are calculated from 29 days only.

1827. Months.	Hygrometer indicating Dew Point.								Scale of the Winds.									Rain.
	Mean Dew Point at Morn.	Mean Dew Point at Noon.	Mean Dew Point at Night.	Mean Dew Point.	Mean Force of Vapour.	Mean degree of Dryness.	Mean degree of Moisture.	Least degree of Moisture.	N.	N. E.	E.	S. E.	S.	S. W.	W.	N. W.	Days.	In. Pts.
Jan. ..	33.5	36.2	34.5	34.7	0.232	1.8	935°	685°	5	4	2	0	2	6	3	9	31	0.57
Feb...	28.6	30.7	30.9	30.	0.200	4.3	862	550	8	3	8	2	3	0	2	2	28	0.79
March	42.1	43.9	42.6	42.9	0.304	3.	894	504	2	0	0	0	2	6	14	7	31	2.50
April .	45.7	47.8	46.4	46.6	0.352	4.4	850	428	1	6	1	6	6	6	2	2	30	0.71
May ..	52.1	54.8	51.9	52.9	0.428	4.7	842	508	0	1	5	5	6	13	1	0	31	2.24
June*.	55.	55.9	54.	54.9	0.460	6.8	797	414	0	5	3	1	5	8	4	3	29	0.82
July .	59.3	58.	58.6	58.6	0.526	9.1	752	420	0	1	3	2	3	9	8	5	31	1.31
Aug. .	56.	56.4	57.3	56.6	0.492	6.7	800	440	1	3	1	3	8	3	6	6	31	1.66
Sept...	54.5	58.8	55.5	56.3	0.492	3.6	906	439	3	6	0	4	3	4	4	6	30	3.37
Oct. ..	49.8	55.3	49.8	51.6	0.414	1.9	932	774	1	2	5	10	4	2	6	1	31	4.06
Nov. .	41.7	45.8	42.4	43.3	0.316	1.5	963	680	2	1	2	4	6	5	5	5	30	1.06
Dec...	42.5	46.4	43.7	44.2	0.328	1.2	964	763	1	0	0	1	5	9	10	5	31	3.09
Aver.	46.7	49.1	47.3	47.7	0.378	4.	874	414	24	32	30	38	53	71	65	51	364	22.18

* In June the Means are calculated from 29 days only.

XLI. *An Account of the manner of Training the Vine upon Open Walls, at Thomery, near Fontainebleau. In a Letter to the Secretary.* *By Mr.* JOHN ROBERTSON, *F. H. S.*

Read March 4, 1828.

DEAR SIR,

THE Vine culture of Fontainebleau is, I believe, but little known or understood in this country, although as applicable to the open wall, it has much to recommend its adoption; in theory it appears rational, and in practice it has proved successful.

Under this impression, having drawn up such information, any way essential, as I could collect from the best French authorities on the subject,* I beg to lay it before the Horticultural Society, that it may be the better enabled to judge whether that practice be such as to merit attention in the Gardens of Great Britain.

The Grapes of Fontainebleau have long been proverbial for their excellence, and continue to maintain a decided superiority over all others in the markets of Paris.

For this superiority, Fontainebleau, or rather the village of Thomery, where these Grapes are chiefly produced, is not indebted to the natural advantages of soil or situation, for the soil is a poor strong clay, hard to work, and the situation a northern aspect, sloping to the Seine, but it is to the judicious culture of its Vignerons, grounded on long experience and

* Chiefly from the Pomone Françoise of Comte LELIEUR, and the Bon Jardinier for 1827.

deliberate observation, minutely and sedulously attended to, that it alone owes its well earned reputation.

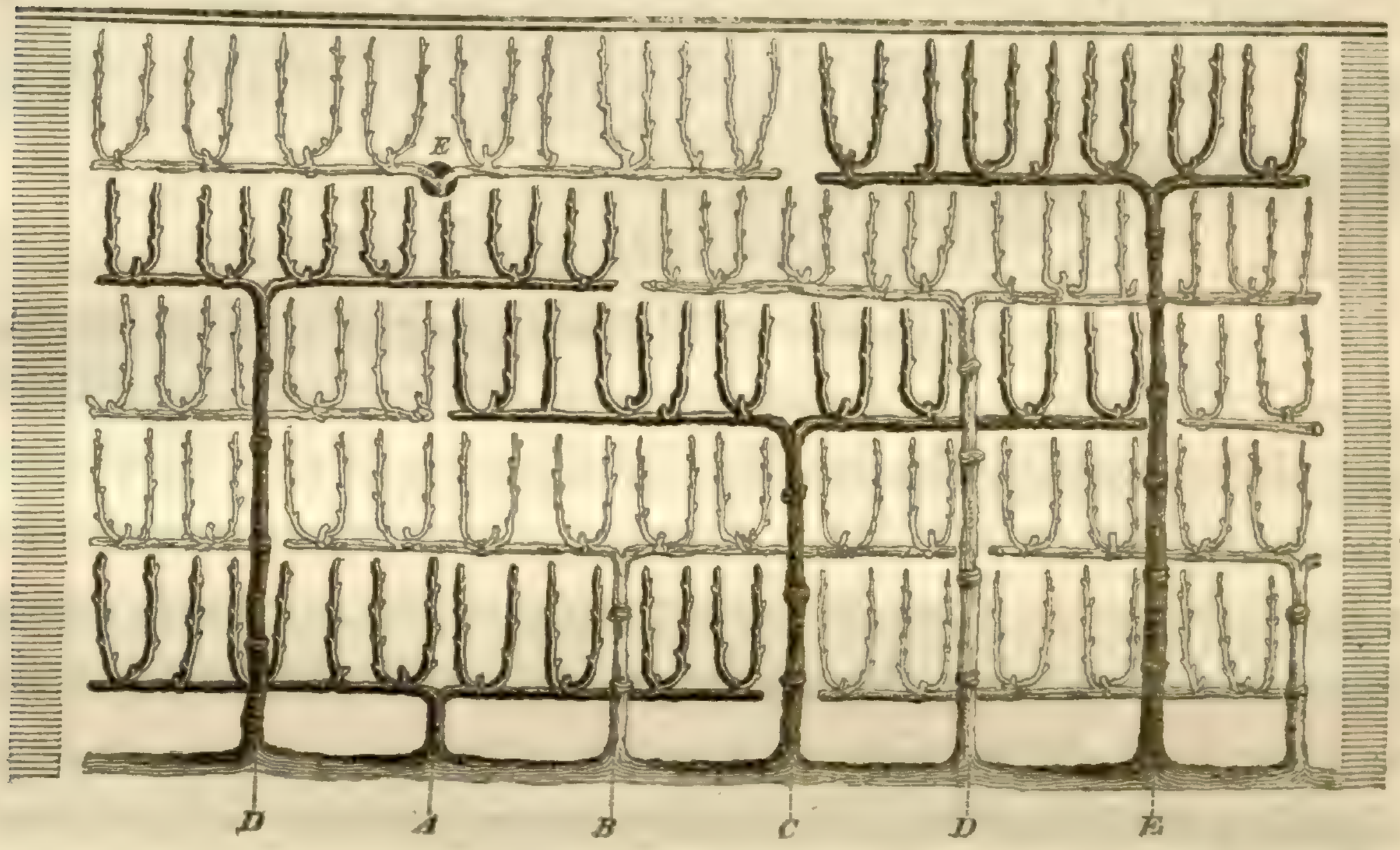
The village of Thomery is situated in the Forest of Fontainebleau, about a league from the palace, on the side of a hill facing north and east, and washed at its foot by the River Seine. The quality of its soil is inferior, in many parts sterile; it was formerly occupied by Vineyards, producing a poor Vin de Pays, and has not been enclosed for the cultivation of table fruit until within these last forty years. At present about six hundred acres are walled in for the purpose, in numerous small properties and divisions.

Walls and Treillage.

The walls with which the Vignerons or Vine gardeners of Thomery form their enclosures are generally about eight feet high, built of clay, plastered on the outside with a cement of lime and sand, and covered by a chaperon or coping projecting nine or ten inches on each side. To this coping they attribute the good effects of protecting the wood and bloom of the Vine from the late spring frosts and heavy rains, sheltering the Grape, accelerating its ripening and moderating the luxuriance of the Vine. It in some degree shades the shoots of the upper cordon or tier, but for that it fully compensates by the protection it affords its fruit late in the season, often preserving it in good condition on the wall until after Christmas.

The southern, western, and eastern exposures of these walls when raised to that heighth, are in general furnished with five tiers or cordons of Vines; in very poor situations, where the

Vines are planted at greater distances than ordinary, and the number diminished, the vacancies are supplied by planting others on the back or contrary side of the wall, and introducing them to the front through apertures. The plan is exemplified in the following Figure.



The treillage against the walls is formed of upright rails, placed at the distance of eighteen or twenty inches apart; to these are attached horizontal bars, nine inches from each other; the lowest bar being six inches from the ground. Each Vine occupying no more than one cordon, and the most suitable distance between each cordon being found to be eighteen inches, a wall of eight feet high will contain five cordons; and the five Vines planted for the purpose will, at twenty inches apart, cover a space of the wall about eight feet in length.

Preparation of the Borders.

In preparing the borders for the reception of the Vines, the Vignerons, trench them the depth of the upper stratum which extends about eighteen inches, and six feet wide. Where the soil is strong, they give the surface of the border a fall, sufficient to throw off heavy rains; this, with the addition of a good dressing of manure, they consider a sufficient preparation for planting.

Selection of Cuttings and Planting.

Although the Vignerons of Thomery occasionally propagate the Vine by laying and grafting, yet for their own planting, they always prefer cuttings; and maintain that they thus not only preserve the kinds from degenerating, but that they actually improve them, in consequence of the attention which is paid in procuring the cuttings from such branches only as bear fruit distinguished by some superior quality, as size, ripening early, setting sure, or any other property it is wished to perpetuate.

The Vine, by happy accident, is often found to sport into improved varieties of fruit; the shoots producing these the Vignerons prefer for propagation, and by such means render them permanent, and each is anxious to excel his neighbours in possessing a superior variety. In this practice we may copy the French with advantage; we have been already most successful in acquiring many valuable varieties of form, flower, and foliage in ornamental plants; and with equal attention we have every reason to conclude that we may be as fortunate in fixing those improved sporting varieties of fruits which are so frequently met with.

The cuttings the Vignerons use for planting, are about two feet in length, and from being taken with a piece of the old wood attached to the heel, are called Crossettes; but this practice may be dispensed with, as a Vine cutting will strike roots along its entire length, though the roots that push from the base of the eyes are always the most vigorous, and of the greatest value, but the goodness of the eyes that are to be left above ground must be especially attended to.

The ground and cuttings being prepared in the month of March, a trench eighteen inches wide, and ten or twelve inches deep, is opened parallel to the wall, and about four feet distance from it; along the trench, and twenty inches from each other, the cuttings are laid slanting with three eyes above ground, in a direction towards the wall, and rising gently from the soil. The young shoots from the cuttings will, under such circumstances, naturally push towards the wall, and run no risk of breaking off when afterwards bent down. After the cuttings are laid in, the trench is filled two-thirds with earth, the heel of each cutting is trod firm, and a coat of mulch is laid over it to retain the moisture, and promote its striking root, which it rarely fails to do. When the young shoots made by the cuttings are of sufficient length, they are staked to secure them from accidents. The ensuing spring all the shoots are taken off except the strongest; a trench ten or eleven inches deep is then formed, in a direction towards the wall, into which, after the reserved shoot has been shortened to three eyes, the whole plant is laid, except that part of the new shoot which remains after being shortened, and this is kept above ground. From these three eyes, shoots are produced, and these, with the rest of the

plant, are treated similarly in the following spring; the same operation being continued in each year until the Vine has reached the foot of the wall, which it generally does the third year after planting, the whole length of the plant becomes thus buried under ground.

The sort most in repute with the Vignerons is the Chasselas de Fontainebleau, or Royal Muscadine; when other varieties are planted, the latest kinds are always trained to the lower bar, as they are there found to ripen earliest.

This method of planting followed at Thomery, differs materially from the practice of other places; in general the Vines are planted at once to the wall, in borders levelled and prepared for other purposes, and at considerable distances. They in consequence absorb an immoderate degree of nourishment, which gives rise to a rank and late vegetation, and retards the ripening of the fruit. At Thomery, the Vines being planted closer, have a more limited range for food, and the numerous roots produced by the frequent laying in of the stems, occupy the border so fully as to prevent any redundancy of moisture or excess of nutriment; and instead of a rank luxuriant growth, they are furnished with short well ripened shoots, closely set with bearing eyes, which, when the ground is well manured, seldom fail to afford abundant crops.

Training and Winter Pruning.

The Vines having gained the foot of the wall should, the first season, be cut back as near the level of the lowest bar as the neighbourhood of two or three good eyes will admit. Two of the best circumstanced shoots from these on the Vine A, designed to furnish that bar, should be trained, one to the right and the other to the left, to form the arms of

the cordon. They should this season be fastened only obliquely to the treillage, as they cannot with safety be laid in a horizontal position until the next; they are then to be shortened to three eyes each, the extreme eye to form a continuation of the cordon, and the two others to form spurs. The season following, these spurs must be cut down to two eyes, and the terminal shoot shortened to three, two of which are to produce bearing spurs as in the previous year, and that at the extremity is to prolong the cordon; every succeeding year the same practice is followed, until each arm has acquired the length of four feet, when the terminal shoot is also to be reduced to a spur, but of the greater length of three or four eyes.

The remaining Vines, B, C, D, and E, being each in succession to form cordons, one above the other, should, when they reach their appointed stations or bars, be also headed down to the three eyes next the levels of those bars; two of these are to be reserved to form arms right and left, as at the lowest bar, and the third, being useless, is displaced; these arms are in every respect to be treated as already directed for the cordon of that bar, until each arm has attained the same length of four feet. Such shoots as in the mean time are produced on the stems below the arms are to be spurred for fruit, but as soon as the cordons are perfectly formed, these should be cleared off and the stems left bare.

During the formation of the cordons, the spurs on their arms will successively come into bearing, and each when pruned down at the season to two or three eyes, will produce as many shoots with fruit. Of these, at the next winter's pruning, only the lowest shoot is to be suffered to remain,

and that at the same time is to be cut back to one, two, or three eyes, according to its strength. The eyes at the bottom of the spurs are very small and much crowded, there are at least six within the space of two lines ;* when the spurs are cut to the length of one or two inches, these small eyes are robbed by those above them ; but when the spurs are cut short, immediately above these eyes, they then break, develope themselves, and produce good bunches. Of this the Vignerons of Thomery are well aware ; they never leave their spurs more than one line long, and sometimes less ; by which means they always keep the bearing wood at home ; and, extraordinary as it may appear, spurs that have borne for twenty years are no more than one inch long. Should more than two shoots break from a spur, all above that number are suppressed, and not more than two bunches are left on each of these, for a moderate crop of good Grapes proves of greater value than a more abundant crop of inferior quality. When the space of walling allotted to the five cordons is completely occupied, about eight feet square, or sixty-four square feet are filled, and the produce calculated on is three hundred and twenty bunches ; for each arm being four feet long, and furnished with spurs six inches apart, the two arms will carry sixteen spurs of two eyes each ; and allowing two bunches to every eye, each tier or cordon should bear sixty-four bunches, the number on five cordons will consequently amount to three hundred and twenty.

This precise length of four feet to each arm has been determined by experience to be the fittest ; the Vignerons found that when the arms were left of a greater length, the

* A French line is one-twelfth part of an inch.

spurs in the centre gradually declined, and good bunches were produced only at the extremities of the cordon; but when reduced to four feet, the spurs on the whole length were perfect, their eyes well filled, and the bunches of fruit fine and well swelled.

Training in cordons after this manner affords these additional advantages; every portion of the wall is equally furnished with bearing wood, and when once the cordons are completed, the pruning and training becomes so uniform and simple, that it may be entrusted to any intelligent workman. But what renders this practice of still greater value in this country is, that *the fruit on these small spurs always ripens earlier than on the stronger wood.*

When Vines are trained with more than one cordon, it is evident from what has already been said, that the lower tiers will eventually become enfeebled by the more powerful vegetation and shade of those above them; but when the Vine is limited to one cordon, it maintains that one in vigour under any such circumstances of privation.

Might not training on these principles, if accommodated to their peculiar natures, be applied with advantage to our Pear trees on walls, and Apple trees on espaliers; it would probably counteract their tendency to run naked at the lower parts and centre, and bear only at the extremities.

When pruning their Vines, the Vignerons avoid cutting close to the eyes, lest they might be injured by the wood dying down to them; the wood of the Vine, from its spongy nature, and the peculiarity of its alburnum, not healing readily, and being liable to decay at a wound. To guard against this, they always cut midway between the eyes, sloping the

cut to the opposite side of the shoot, so that the eye may not be damaged by its bleeding. They are also careful to inflict no wounds unnecessarily, and those they do make, they finish off in the neatest manner.

The season they generally prefer for the winter pruning is from the beginning of February to the beginning of March, before the first movement of the sap takes place. The earliest pruned Vines are found to break first.

Summer Pruning or Training.

The summer pruning commences with the growth of the the young wood, and consists in cutting out all dwindled and weak shoots that may not be necessary to replace failures in the spurs ; also such as are double and triple, as well as bearing shoots, which have not sufficient strength to bring their fruit to perfection ; in general, preserving upon each spur, but one or two shoots in bearing. All others are retrenched which cannot be well laid in, or which are not destined to serve some present or future purpose. But as premature summer pruning is productive of the same bad effects as follow late summer training, in occasioning wasteful bursts of sap, it is considered prudent, before the stronger shoots are cleared off, to wait until the wood has acquired some consistence, and until new channels are prepared for the expenditure of the sap by the expansion of the leaves.

Summer pruning is of the highest importance to the Vine, and should be repeated as often in the season as may be necessary ; but care must be taken in this operation, for stripping a plant of its leaves and shoots suddenly, always gives a shock to its vegetation, which is the more or less

prolonged, in proportion to the degree in which it is inflicted, on which account, until the Grapes are well set, it should be done gradually.

The collateral shoots which break near the eyes or on the young wood, should be carefully suppressed, and the tendrils pinched off while young, but never torn away, as that might cause a serious injury to the shoot.

PINCHING OR STOPPING THE YOUNG WOOD.

Stopping the young shoots by pinching off their tops at certain periods of their growth is useful to fruit trees in general, but especially to the Vine. The Vignerons of Thomery practise it with much intelligence and success. It has the effect of momentarily suspending the flow of sap in these shoots, and by that means it accelerates their maturity, and renders them more ligneous. It promotes the growth of the eyes, and is indispensable for the purpose of filling the lower eyes of the spurs on which cultivators rely for next year's crop; pinching or stopping the wood either prematurely or tardily is alike productive of bad consequences. At Thomery, the young wood is pinched after the bloom is set, as soon as it reaches the cordon next above it, that is at about the eighth or ninth eye; weak shoots are pinched sooner in proportion to their strength, but none are permitted on any account to push beyond the cordon. Should it appear that the shoots of the extremities impoverish those of the centre, the former are pinched repeatedly until the equilibrium is restored.

When the Vignerons of Thomery, before the adoption of the present system, during a period of thirty years, made

a practice of planting their Vines far apart, their growth was so luxuriant that they were under the necessity of leaving a distance of two feet between each cordon, and even that was found insufficient as they shot beyond it, and could only be kept within bounds by repeatedly cutting in the young wood, though in an advanced state; but since they have adopted the practice of close planting, and by a judicious selection, have procured varieties which grow more kindly, pinching alone is found sufficient to keep the plants in order.

As soon as the young shoots of the Vine have grown to a sufficient length, they are attached to the treillage, the stronger ones first, but loosely, until they have acquired sufficient elasticity.

Care of the Fruit.

Some time after the first tying in of the young wood, the bunches of fruit should be looked over, and the extremities of such as are very long cut off, for they generally ripen late, and imperfectly. Not more than two bunches are permitted to remain on a shoot; where a third appears, the upper one is taken off; should the plant be weak, even the second is displaced. Close bunches also, such as the Frontignans, should have their berries thinned out. The time for these operations is when the berries are about the size of peppercorns: this work should be accompanied by searching the bunches for the Larva, or Caterpillar of a Sphynx, or species of Moth, which chooses these close clusters as a retreat, and there envelope themselves in a silky web, which retains the moisture in rainy seasons and rots the bunches.

Disleafing the Vines, to give colour to the Grapes, and

promote their ripening, is attended to, as soon as the bunch gets three-fourths ripe; in doing this, the leaf is torn off at the extremity of the footstalk, which is left behind to attract the sap, and nourish the bud at its base.

Bagging the bunches, to protect them from birds and insects, and preserve them late, is done before they acquire perfect maturity, and always on a dry day. Hair bags are preferred to those of any other material. But the practice of bagging is not general. The Vignerons often preserve Grapes on their treillages until Christmas by screening them from the frost with cloths, matting, or fern. None but the driest weather is chosen for gathering in the crop, it would quickly spoil if stored moist. The bunches are handled with nicety, and only by the stalk, to preserve the bloom; those intended for keeping are cut before they are quite ripe. Some are spread on beds of fern, others are hung up on hair lines in reverse, with the shoulders down, as that position prevents the berries from lying so close as to rot.

Tillage and Manuring.

In tillage the Vignerons use no other tool than their hoe; they stir the ground but lightly, lest they should injure or disturb the roots; this is done twice in the year, first after the summer training, which generally takes place about the end of May; and again when the leaves fall; the ground is besides, always kept perfectly clean and loose on the surface, to admit the air and dews.

It is contrary to general practice, to give Vines any other manure than such as they may casually receive when spread for other crops on the borders; it is not so with the

Vignerons of Thomery, they manure theirs every three years, and the result justifies them in the practice, for their Grapes are always superior both in size and delicacy of flavour to any others to be met with either at Paris or elsewhere. Old manure nearly consumed, and of a light warm nature, is always preferred.

Such is the culture of Thomery; but it is to the following peculiarities of practice that its superiority must principally be attributed.

1st. To the judicious choice of cuttings. The Vignerons never making use of any but such as have borne the best and finest fruit.

2nd. By planting the Vines at a distance from the wall, and by frequently laying the shoots until they reach the wall, the Vines acquire abundance of roots upon the surface. Also by the close planting, from which all undue luxuriance is restrained; by this means the branches complete their growth within the bounds prescribed, and ripen their wood early.

3rd. By limiting each plant to only one cordon, with two arms, right and left, the entire extent of both not exceeding eight feet. The energies of the roots confined to so small a space, nourish the bearing wood more effectually and more equally, and bring the fruit to greater perfection.

4th. To the projecting coping, which protects the Vine and fruit from frosts and heavy rains, and intercepts and retains the heat radiating from the surface of the soil.

5th. The sloping disposition of the ground also contributes to their success, as it prevents any accumulation of moisture at the roots of the Vines, and preserves them sound and healthy.

It has often been a subject of remark, that Vines planted against buildings with pavement round them, which prevents the ground from being either worked or manured, produce not only more abundant and finer crops, but are longer lived, and grow to a greater size than others. A case cited by the Comte LELIEUR confirms the observation, and serves to explain the cause. At Thomery, the Grapes on the lower cordon of a Vine planted to a wall of about fifteen feet high, having been injured by the drip of its eaves dashing the earth of the border against them, the owner paved it for a breadth of about two feet from the wall. The good effects of this remedy were soon apparent, not only in the preservation of the fruit from injury, but in the improvement of its size and flavour; the reflection of the sun's heat from the pavement augmenting both, and hastening its maturity. The growth of the Vine also became more moderate and regular, being no longer influenced by the capricious extremes of drought and moisture, as its roots under the protection of the pavement rose to the surface of the border, and there enjoyed an equable degree of both, and a superior warmth.

How far this practice of paving round their roots, can be applied to the Vines of this country in the open air, may be a question; but I apprehend that there can be no doubt, as to the advantage of covering the borders of such, as are planted in stoves or vineries, with a slight coat of gravel, not only for the reasons above-mentioned, but to prevent the possibility of any other crop being raised on them, as is generally the case, to the injury or even destruction of their roots on the upper surface.

We too frequently err, in making our borders for Vines

or Peaches deeper than the influence of the sun and air can reach. Their depth should always be regulated by the temperature of the climate. In such a climate as that of France, where the summer heat is powerful, and penetrates deeply, if three or four feet be necessary, in Great Britain or Ireland, where it is comparatively feeble, one half the depth may be sufficient, and a greater would prove pernicious; but of all situations, that of a sunny sloping bank is most congenial to the nature of the Vine; this the experience of all ages has confirmed—

denique apertos
Bacchus amat colles ——

I remain, dear Sir,

your's, very truly,

JOHN ROBERTSON.

Kilkenny,
February 25, 1828.

Note by order of the Council.

The Council, in directing this Paper to be published, are desirous to explain that, although in doing so they depart from their usual practice of inserting nothing in these Transactions which they are aware is not original, yet they trust that the useful nature of this Communication, and the importance of it to the interests of Horticulture in Great Britain, will form a sufficient justification of their thus laying it before the Public.

No. XLII. *Observations on the Cultivation of Stove Plants. In a Letter to the Secretary.* By Sir Edward Poore, *Bart. F. H. S.*

Read July 17, 1828.

Sir,

Having always been very much dissatisfied with the appearance those plants commonly called Stove Plants usually present when grown in pots, I determined to try the experiment of forming a Conservatory in which they might be turned out to grow at liberty, and where I might hope to see finer and more luxuriant specimens of my favourites, than I had hitherto been able to produce. For this purpose I built a Plant-House 32 feet in length, 20 in width, and 13 feet 6 inches high, with a span roof. A pit occupies the whole of the house, excepting a front and back walk, and the space necessary for the flues, of which there are two; there is also a cistern at one end. The pit was made about four feet deep, well drained and filled with a compost of fresh turf and loam, peat earth, sand and a stratum of leaves at the bottom; these were all used in their recent state and merely roughly chopped up, and mixed together; I found the leaves heat pretty strongly through the mass at first, but this after a time ceased. Having completed this, in January last, I proceeded to turn out nearly all my Stove Plants, and I will now detail the progress they have since made.

Ficus elastica, was when turned out about six feet high, it is

now nearly eleven, has made a side shoot six feet long, is stout in proportion, and the leaves are in general one foot five inches long, and from five to six inches broad.

Carolinea insignis, turned out in March, was then seven feet high, has since made shoots two feet three inches long, and the leaves are much larger than usual.

Jacaranda Mimosæfolia, when planted out was one foot six inches high, and has made a most astonishing growth, being now nine feet high, and the compound leaves two feet six inches long, and one foot two inches wide.

Averrhoa Carambola, is now more than seven feet high, has formed side branches extending six feet eight inches wide, and strong in proportion. This plant bears cutting as well as a hardy plant. I have been obliged, from its great luxuriancy, to cut it very close back, but it is making very strong shoots again.

Coccoloba pubescens, is about six feet high, was planted out in March, has three branches, has formed a new shoot and leaf, upon each of the side branches, and the centre one has made two leaves, and has grown one foot at two starts. The stem shoots about six inches, carrying up the embracing leaf folded up, which then gradually but rapidly unfolds; it has at first a dull flesh colour, is most beautifully veined, and its appearance, when looking through it against the light, is exactly that of a surgical preparation, the veins of which are injected with red wax; this quickly goes off, and the leaf assumes its usual hard, stiff texture. The leaf when expanded is two feet eight inches across, and two feet long.

Astrapæa Wallichii, was when put in, in March, about three feet six inches high, it has made side shoots two feet

long, the branches extend more than six feet, and the leaves one foot two inches by one foot six inches.

Hernandia sonora, turned out in March, has shot two feet, the leaves are one foot four inches long by one foot across; the leaf stalk one foot long, and the red centre of the disk very vivid, contrasting beautifully with the rich green of the rest of the leaf.

Crinum amabile, a last year's sucker, the leaves are now four feet two inches long, and five inches in width.

Canna Nepalensis, five feet eight inches high, flowered continually until I cut it away to make room for other plants. It had thrown up numerous suckers, all flowering.

Caladium odorum, planted out in March, in a dormant state, has its leafstalks three feet ten inches high, the leaves being one foot five inches long and the same across.

Barringtonia speciosa, was sent me last autumn in a dormant state, it was kept in a Pine stove, but I ventured to turn it out, seeing how well every plant succeeded; it has made fresh leaves, looks very healthy, and is pushing vigorously.

Stachytarpheta mutabilis, was put out a mere stake, about two feet six inches high, it has made shoots five feet long, from which proceed side shoots, every one terminated by a spike of flowers, from one foot seven inches long to about a foot.

Clerodendrum infortunatum, is quite a weed, throwing up suckers all over the bed, it has been cut down, and has again sent up shoots three feet six inches high; the leaves one foot two inches long, and a foot wide, it is now shewing flower. Will prove a troublesome plant, and must be eradicated.

The following climbers planted in March, have covered pillars eleven feet high, and hang over in rich festoons, flowering in the most luxuriant manner.

Pergularia odoratissima.
Solanum Seaforthianum.
Bignonia venusta.
Ipomea insignis.
——— *Jalapa.*
Passiflora lanata.
——— *serratifolia.*
——— *edulis.*
——— *alata.*

Xylophylla latifolia, has been in flower since March, as has also

Pleroma heteromalla, which has made strong shoots.

I have only mentioned the plants I thought most deserving notice, but the whole collection is healthy and thriving beyond my most sanguine expectations, not a single plant being etiolated, but all in vigorous growth. I have constantly managed this house myself, the heat has been kept up to an average of 75° in the shade, falling at night sometimes as low as 50°; the atmosphere has been saturated with moisture by keeping the walks and flues flooded with water; steaming was employed as long as fires were used, and syringing at all times.

By constant attention I am very little annoyed with insects of any kind; the mealy insect is the most troublesome. I have been in the habit of using as an efficacious and cleanly preparation for destroying all kinds of insects, a strong infusion of common soap in warm water to which I add the proportion of two fluid ounces of camphorated spirits of wine to

every pint of the liquid. When I use this, I put a piece of common soap in a large gallipot, pour a small quantity of the liquid upon it, and with a large soft camel's hair brush make a thick lather, with which I cover the insects, they then die almost instantly.

I trust the success of this experiment may induce others to try on a larger scale to produce still grander effects; when we may hope to see some of the magnificent productions of the Tropics flourishing in all their native luxuriance.

I have the honor to remain,

your's very obediently,

Edward Poore.

Rushall, Wilts.
July 10, 1828.

No. XLIII. *Upon a method of obtaining late Flowers of Ranunculuses. In a Letter to the Secretary. By Mr.* Henry Groom, *F. H. S.*

Read September 16, 1828.

Sir,

In compliance with your wish, I have sent a few remarks relative to the culture of Ranunculuses for a late bloom.

The bed is prepared the same as for spring planting, with the exception of being quite level with the path; this I find necessary to preserve the fibres moist. In planting instead of cutting out drills, and placing the roots at the bottom, I prefer having the surface of the bed sufficiently fine to allow me to dibble them in; I afterwards fill the holes by covering the bed with a small portion of fine mould, which with the depth the roots are planted, places them about one inch below the surface. As soon as the bed is thus finished it should be well watered; I use lime water at this time, to prevent the worms drawing the roots from their places. The bed must afterwards be kept well watered with clear cow-dung water (I do not like horse-dung for Ranunculuses,) until the foliage makes its appearance; I then have the iron rods used for the Tulip bed put over the bed, and keep it well shaded, never allowing the direct rays of the sun to come to it from nine in the morning till five or six in the evening, as I find that during the summer the sun acts too powerfully on the soil for Ranunculuses. It appears to me that when the sun is permitted to come full on the bed, the earth is so much heated that the

moisture which is necessary for the growth of the plants is not only evaporated too quickly, but also raised to a temperature so high that the fibres near the surface are scalded, and if not destroyed certainly very much injured. The watering must be continued when necessary, still using cow-dung water; I have found the most beneficial effects to Ranunculuses from the use of this fluid; it increases the foliage and bloom very considerably.

The time of planting the roots must depend on when the blooms are wanted; for a bloom in September or October, I generally plant about the middle of July, but I recommend planting every fortnight or three weeks, commencing in February, which will keep up a fine succession. I have this day planted some in a frame, which I expect will bloom about January or February.

I have the honour to be, Sir,

your most obedient Servant,

HENRY GROOM.

Walworth,
September 14, 1828.

XLIV. *Upon the proper management of Plants during their Voyage from China to England. In a Letter to the Secretary. By Mr.* JOHN DAMPER PARKS, *F. H. S. Gardener to the Earl of* ARRAN, *F. H. S. at Bognor, Sussex.*

Read February 5, 1828.

SIR,

I BEG leave to lay before the Society the result of the experience I acquired in managing living plants on ship-board during my voyage to China, in the service of the Society, in the spring of 1823. The kind of case which I found most convenient was an oblong square box with a span glass roof, such as is recommended by Mr. LINDLEY in the fifth volume of the Transactions, page 192, to the representation of which in that place I refer. Its width inside should be about eighteen inches, so as to receive two rows of square wooden pots made to fit in accurately. The glazed sides of the roof should be moveable, and hinged to the case by their lower edge; and, if possible, they should be fitted with transparent oyster shells, such as can readily be procured at Macao, instead of glass. Hooks should be adapted to the ends, for the purpose of keeping the glazed sides open in fine weather. The bottom of the case should be double, with a cavity of half an inch, to allow for the running off of salt water in case it gets in when the decks are washed. The whole should be covered by a water-tight tarpauling, without which it would be impossible to keep the cases on deck, which is much the best place.

When the plants are put into the box the whole of the

mould should be covered with moss, to prevent its being shaken out of its place, and likewise to keep it moist. After this it should be crossed with laths, nailed tightly down.

The best situation for plants on board ship is where they get plenty of sun and light, the poop being the best of all, as it is the least shaded by sails, &c. If it should be found that the plants are receiving too much sun, it is easy to shade them by closing one shutter, or by using the tarpauling as a shade. Exposure to the sun is however indispensable, in order that the wood as it grows may become hard, and endure the vicissitude of climate the better. To mature a plant for a change of latitude and climate is of the greatest importance in point of success. In securing the plants at night, whoever has the care of them should effect this by shutting the glazed sides and unrolling the tarpauling as late in the evening as possible. In a hot climate, opening the boxes again as early in the morning as possible, is also requisite.

Watering the plants should be done sparingly, so long as they are seen not to droop and remain in good health; they do best when not much watered; with much water they grow too luxuriantly, which is a disadvantage with reference to the changes they may have to undergo. This is the great point which ought to be borne in mind in transferring plants from a tropical to a colder latitude, which will destroy them if not properly prepared for it.

Before I went to China, I had formed an opinion that some plants which it has at present been found impossible to bring alive to England, might be safely transported in the form of cuttings under bell glasses; such, for example, as the Double Red and Single Striped Azalea Indica. In this opinion

my subsequent experience completely confirmed me. I believe their death is entirely caused by the salt atmosphere, which they cannot endure; and it is obvious that if under glass, they would be secured from this.

Much depends upon the season of the year when plants are brought from China. The period of leaving China should, if possible, be January or February, as the sun at that time is not far distant in point of latitude from the ship's course, at least not so much so as at some other parts of the year. As the ship bears to the North of the Line the sun will be doing the same. Another great object is to arrive in England as late in the spring as possible, after the cold weather is past; many plants are often lost after coming into the English channel.

I adduce the following circumstances in support of the foregoing observations. When I was outward bound to China, with fruit trees, esculent vegetables, &c. under my charge, my plants were placed in the long boat, between the side of the long boat and another boat within it; one portion was exposed to the sun and light, and these, generally speaking, did well; the remainder were so placed that they got little or no sun, and nearly the whole died while they were passing the Cape of Good Hope, the plants being tender and full of sap, the climate cold, and the ship sailing to nearly 40° south latitude, at our Midsummer, that is in the Midwinter there. When homeward bound, I had four boxes filled with Camellias, each box containing ten plants; two of these were placed on the poop (as most of my plants were,) these had not a sick or dead plant in them when they arrived in England; the two others were placed under the poop projection, which together with the deck for many feet was covered with an

awning during the whole of the day, for the comfort of the officers ; this totally excluded the sun, and in a great measure the light, and in each of these two boxes the plants were half dead.

The Commander, Captain BAKER, had plants of the large Yellow China Rose, placed in the after cabin, which died in three weeks after we left Canton. I lost during the whole voyage only one out of four of this sort of Rose which were placed on deck.

I am, Sir,

your most obedient Servant,

JOHN DAMPER PARKS.

Arran Lodge,
January 28, 1828.

XLV. *An Account of a Cherry Orchard, at Hylands, near Chelmsford, the Seat of* Peter Cæsar Labouchere, *Esq. F. H. S. In a Letter to the Secretary. By Mr.* John Smith, *the Gardener.*

Read March 4, 1828.

Sir,

Agreeably to your request, I have sent you a Sketch of the Cherry Garden at this place. Gardens of the same kind I understand, are not uncommon on the Continent, but this is the only one I have ever seen or heard of in Great Britain. The intention of these Gardens is to preserve the fruit on standard trees perfect till a late period, and secure from the attacks of birds. They also form an agreeable resort for the family. Not only Cherries are grown in them, but other fruits, such as Gooseberries, Red, White, and Black Currants, Raspberries, and Strawberries.

Every person connected with Horticulture is aware of the unprofitableness of Standard Cherries, in consequence of their being so liable to the attacks of birds; or if they are protected by nets, of the labour of undoing and again securing them every time a gathering is wanted. Here that difficulty is entirely done away with, for after the net is once on, there is no further trouble till the crop is used.

The space of ground taken up in this garden is about one rood and twelve perches (see Plan at the end); it is surrounded by a wire fence A, nearly nine feet high; this fence consists of iron bars, two inches by a quarter of an inch, fixed into oak posts, B, about four feet apart; the space between these is filled up with wire-work, so close as to exclude the smallest birds; at the bottom is a plank of oak, one foot wide, and two inches thick, stretching from post to

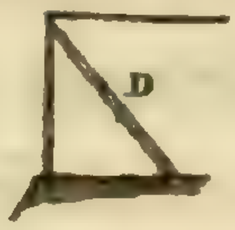
post, half under and half above the ground; to the bottom edge of this are nailed slates, eighteen inches long, to exclude moles and other vermin. At the top of this fence are fastened hooks on an iron rod; on these is fixed the rope which is passed through the edge of the net, the meshes of which are about an inch and a half wide; the net is in three pieces, one of which is secured to one end of the garden, and carried over the tops of the posts, C, the second or middle piece is netted to it, and the third is attached in the same manner as the first. The net is then tied all round with twine to the top rail, thus forming a covering of one united piece of net work. Previously to the putting on of the net, two sides of the garden are secured with stout rails, as at D; these are to keep the net from pulling in the ends of the upright fence, which it would otherwise do during rain or damp evenings, at which times the net becomes quite tight; the other sides, lying in the elastic line of the net, do not require any support. The posts, C, are only in use during the fruit season, after which they and the netting are put by till again wanted. The former fit into sockets upon which caps are placed when they are not in use. The posts have also circular caps at the top, in order that the net may slide smoothly on them, and likewise to prevent its weight from forcing them through it, which sometimes happens notwithstanding this precaution.

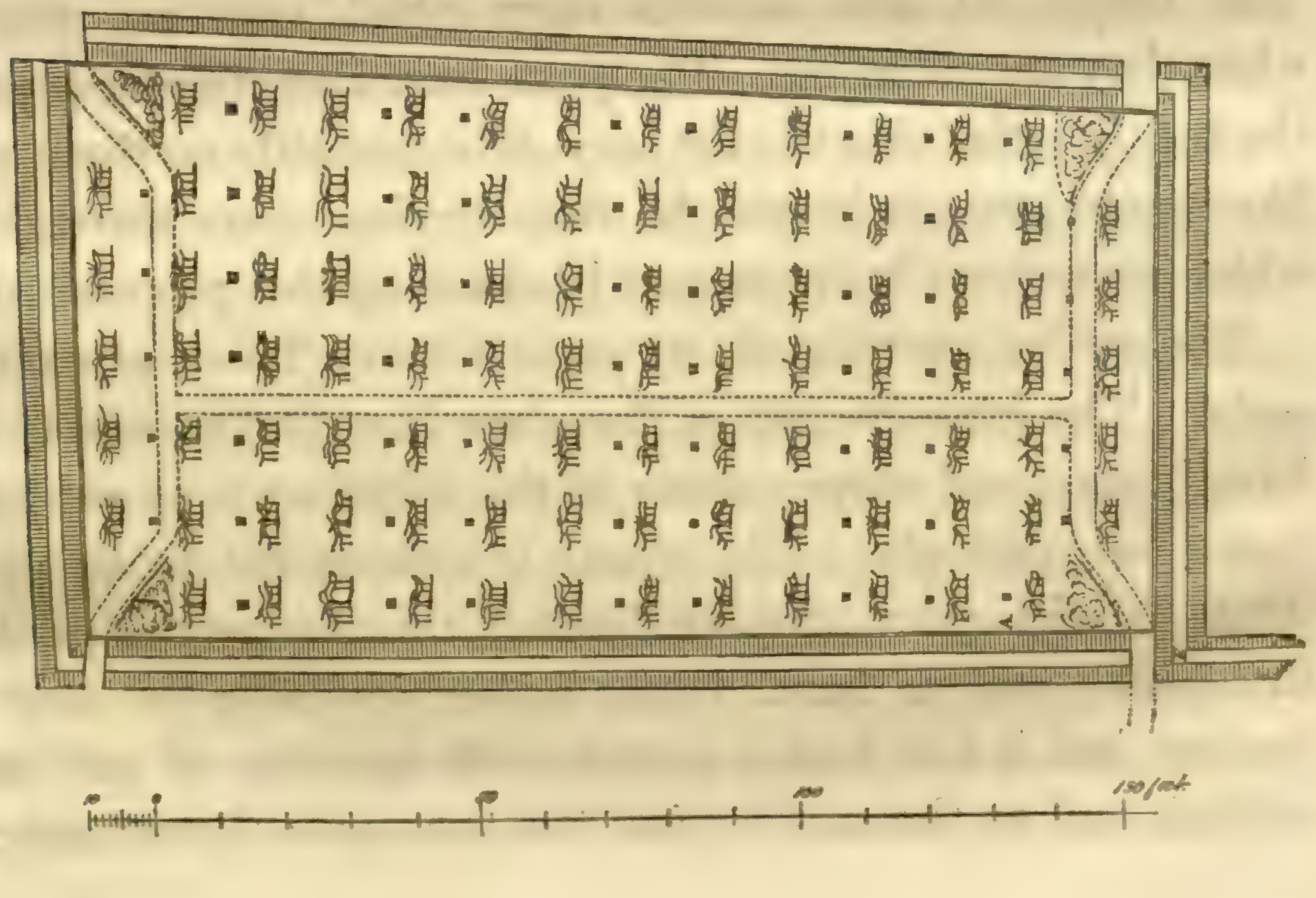
The garden contains ninety-eight Cherry Trees, of various sorts. The greatest part of them are May Dukes, and these have borne good crops; some of the other sorts as yet have borne but sparingly. The whole is surrounded by an open ditch, E, with green sloping banks; this keeps the garden dry. The soil is hazel loam, rather inclining to clay at bottom, but it has had a considerable quantity of old lime rubbish laid on the surface, and the trees grow luxuriantly.

The garden was constructed in 1821, by Mr. ATKINSON, from designs which Mr. LABOUCHERE had brought from the Continent. The plan I pursue in pruning my trees in this Orchard I shall take a future opportunity of communicating. The branches are brought to a horizontal position by means of rough stakes, F, having as many hooks as possible left on them, which save the trouble and expence of tying.

I remain, Sir,
your most obedient humble Servant,
JOHN SMITH.

Hylands,
February 20, 1828.





XLVI. *An Account of an easy method of destroying Caterpillars on Gooseberry Bushes. In a Letter to the Secretary. By Mr.* Richard Williams, *Gardener to* Thomas Andrew Knight, *Esq. F.R.S. &c. &c. President.*

Read June 3, 1828.

Sir,

I have taken the liberty to send you the following account of an easy method of destroying Caterpillars upon Gooseberry Bushes, which is not known, I suppose, to gardeners, as I frequently see great damage done by these insects. Whilst my master was absent in London in the spring of last year, a very large number of Caterpillars appeared upon almost every Gooseberry Bush in the garden here. Their number was so great that I thought it useless to attempt to destroy them by picking them off, or by any other means which I had employed in former seasons; but having some quick lime fresh from the kiln ready for other purposes, I sprinkled some of it upon the Caterpillars, and I saw that as soon as it touched them they dropped from the Bushes. I then proceeded immediately to sprinkle every Bush in the garden, taking up the lime in my hands at first, and afterwards in a small wooden spoon, standing on the side from which the wind blew, and dashing it in among the leaves of each Bush. As soon as all the Caterpillars had fallen off, I placed with my hands round the bottom of the stem of every Bush about half a pint of lime, to prevent the Caterpillars climbing up, and I saw no more of them. But in about a month after-

wards, a second hatch appeared upon some of the Bushes, when I again used the quick lime with the same effect. What became of the Caterpillars I do not know; I saw a good many alive upon the ground, under some of the Bushes the day after they had dropped off, but I suppose they all perished, for not a single one has been seen in the garden this year, though in every preceding year they gave me a great deal of trouble.

I am Sir,

your very obedient Servant,

RICHARD WILLIAMS.

Downton, near Ludlow.
May 28th, 1828.

XLVII. *On the Culture of the Potatoe.* *By* THOMAS ANDREW KNIGHT, *Esq. F. R. S. &c. President.*

Read July 1, 1828.

WHATEVER may have been the amount of the advantages, or injury, which the British Empire has sustained by the very widely extended culture of the Potatoe, it is obvious that under present existing circumstances it must continue to be very extensively cultivated; for though it is a calamity to have a numerous population who are compelled by poverty to live chiefly upon Potatoes, it would certainly be a much greater calamity to have the same population without their having Potatoes to eat.

Under this view of the subject, I have been led to endeavour to ascertain, by a course of experiments, the mode of culture by which the largest and most regular produce of Potatoes, and of the best quality, may be obtained from the least extent and value of ground; and having succeeded best by deviating rather widely from the ordinary rules of culture, I send the following account of the results of my experiments. These were made upon different varieties of Potatoes; but as the results were in all cases nearly the same, I think that I shall most readily cause the practice I recommend to be understood by describing minutely the treatment of a single variety only, which I received from the Horticultural Society, under the name of LANKMAN's Potatoe.

The soil in which I proposed to plant being very shallow, and lying upon a rock, I collected it with a plough into high ridges of four feet wide, to give it an artificial depth. A deep furrow was then made along the centre and highest part of each ridge; and in the bottom of this, whole Potatoes, the lightest of which did not weigh less than four ounces, were deposited, at only six inches distance from the centre of one to the centre of another. Manure, in the ordinary quantity, was then introduced, and mould was added, sufficient to cover the Potatoes rather more deeply than is generally done.

The stems of Potatoes, as of other plants, rise perpendicularly under the influence of their unerring guide, gravitation, so long as they continue to be concealed beneath the soil; but as soon as they rise above it, they are, to a considerable extent, under the controul of another agent, light. Each inclines in whatever direction it receives the greatest quantity of that fluid, and consequently each avoids, and appears to shun, the shade of every contiguous plant. The old tubers being large and under the mode of culture recommended rather deeply buried in the ground, the young plants in the early part of the summer never suffer from want of moisture; and being abundantly nourished they soon extend themselves in every direction till they meet those of the contiguous rows, which they do not over-shadow on account of the width of the intervals.

The stems being abundantly fed, owing to the size of the old tubers, rise from the ground with great strength and luxuriance, support well their foliage, and a larger breadth of this is thus, I think, exposed to the light during the whole

season, than under any other mode of culture which I have seen; and as the plants acquire a very large size early in the summer, the tubers, of even very late varieties, arrive at a state of perfect maturity early in the autumn.

Having found my crops of Potatoes to be in the last three years, during which alone I have accurately adopted the mode of culture above described, much greater than they had ever previously been, as well as of excellent quality, I was led to ascertain the amount in weight which an acre of ground, such as I have described, the soil of which was naturally poor and shallow, would produce. A colony of Rabbits had, however, in the last year, done a good deal of damage, and Pheasants had eaten many of the tubers which the Rabbits had exposed to view; but the remaining produce per acre exceeded five hundred and thirty-nine bushels of eighty-two pounds each, two pounds being allowed in every bushel on account of a very small quantity of earth which adhered to them.

The preceding experiments were made with a large and productive variety of Potatoe only; but I am much inclined to think that I have raised, and shall raise in the present year, 1828, nearly as large a produce per acre of a very well known small early variety, the Ashleaved Kidney Potatoe. Of this variety I selected in the present spring the largest tubers which I could cause to be produced in the last year; and I have planted them nearly in contact with each other in the rows, and with intervals, on account of the shortness of their stems, of only two feet between the rows. The plants at present display an unusual degree of strength and vigour of growth, arising from the very large size (for that variety,) of the

planted tubers; and as large a breadth of foliage is exposed to the light by the small, as could be exposed by a large, variety; and as I have always found the amount of the produce, under any given external circumstance, to be regulated by the extent of foliage which was exposed to light; I think it probable that I shall obtain as large, or very nearly as large, a crop from the small variety in the present year as I obtained from the large variety in the last. I have uniformly found, that to obtain crops of Potatoes of great weight and excellence, the period of planting should never be later than the beginning of March.

Postscript.

March 23, 1829. Somewhat contrary to my expectations, the produce of the small early Potatoe exceeded very considerably that of the large one above mentioned; being per acre 665 bushels of 82 pounds. It is usually calculated by farmers that eighty pounds of Potatoes, though eaten raw, after they have begun to germinate, will afford two pounds of Pork; and I doubt much if the haulm, and the whole of the manure made by the hogs, were restored to the ground, whether it would be in any degree impoverished. I am not satisfied that it would not be enriched,—an important subject for consideration in a country of which the produce is at present unequal to support its inhabitants, and which produce is I confidently believe and fear growing gradually less, whilst the number of its inhabitants is rapidly increasing.

XLVIII. *On the Cultivation of the Pine Apple.* By Thomas Andrew Knight, *Esq. F. R. S. &c. President.*

Read August 19, 1828.

I have now completed a long course of experiments upon the culture of the Pine Apple in the Dry Stove, the object of which has been to ascertain the means by which that species of fruit might be most advantageously grown, and particularly at those periods of the year, when the scarcity of other fruits gives it an additional value. In these experiments I have endeavoured to ascertain the effects of excess of drought, and of moisture; and of very high, and of very low, temperature. I have of course, sacrificed manyplants in experiments, which I neither found, nor expected to find, successful; but from these I have derived information, which I believe will prove useful to the cultivators, and advantageous to the consumers, of that species of fruit.*

* I have, in a communication last year to the Horticultural Society, (p. 255 of this Volume) shewn that the mould in pots circumstanced as those which contain my Pine Apple plants are, acquires a temperature very nearly equal to that of the aggregate temperature of the air in the house, but not subject to such extensive variations. Thus, if the highest temperature of the air within the house during the day be 90° and the lowest during the night be 70°, the temperature of the mould in the pots will nearly approximate the arithmetical mean 80°: and surely the intelligent gardeners of the present day must be fully sensible that mould at eighty degrees is warm enough without the aid of the irregular and ungovernable heat of a bark bed, whatever their ignorant predecessors, who first introduced the bark bed into the Pine stove, may have thought.

The effects of a very dry atmosphere necessarily were an inspissated state of the sap of the plant, and this, as it does in all other similar cases, led to the formation of blossom buds and of fruit; and it thus operated upon some Pine Apple Plants to such an extent as to cause even the scions from their roots to rise from the soil with an embryo Pine Apple upon the head of each, and every plant to shew fruit, in a very short time, whatever were its state and age.

Very low temperature, under the influence of much light, by retarding and diminishing the expenditure of sap in the growth of the plants, comparatively with its creation, produced nearly similar effects, and caused an injuriously early appearance of fruit.

Very high temperature if accompanied with a sufficiently humid state of the atmosphere, I found beneficial at all seasons of the year under a curvilinear iron roofed house, for this admitted as much light even in the middle of winter, as the Pine Apple Plants appeared to require.

Many months previous to the publication of Mr. DANIEL'S very excellent communication in the Transactions of this Society, (Vol. VI, page 1,) and without being in any degree acquainted with his opinions, I had placed unglazed shallow earthen pans upon the flues of my curvilinear-roofed stove, such as he has recommended, nearly in contact with each other; and I had increased the dampness of the air within the house by keeping the ground, which is not paved, constantly very wet. The effects of excess of humidity in the air of the house were, as might have been anticipated, diametrically opposite to those which had resulted from drought; and the plants grew so rapidly as to become soon too large for the

spaces allotted to them without indicating at any season of the year a disposition to shew fruit. By subjecting these plants to the influences of the drier atmosphere their exuberance of growth was soon checked; and the production of fruit immediately followed in every season of the year, provided that a sufficiently high temperature was given.

I have never cultivated the White Providence Pine Apple, because I never thought it worth culture; nor any of the large varieties, excepting a very few of the Enville; and I have scarcely ever had a plant which has not fruited within less than twenty months of the period at which the sucker was taken from the parent plant; and the suckers were invariably taken off at the same time with the fruit. The utmost horizontal space which I have ever allowed to any plant has not exceeded twenty-three by twenty-four inches during the latter half of its life, and less than half that space during the preceding part of it, and I, in consequence, have never had a Pine Apple which has weighed quite four pounds.* But I possess at the present moment succession plants of the greatest excellence, and such as I could cause to bear fruit of very great weight, if I chose to give them age and space; for comparatively with the age, and spaces allotted to the plants in my fruiting house, the fruit of my older plants is of very large size, and in every respect exceedingly perfect. I also obtain a regular succession of produce without having ever many Pine Apples ripe at the same period of the year; and I can venture confidently to

* Since the above was written, I sent a black Jamaica Pine Apple to the Horticultural Society, the produce of a plant which was some months less than two years old, and which was confined to the space above mentioned, which exceeded 4¼ pounds in weight; but I have had no other quite so heavy.

assert that I could without difficulty, in properly constructed stoves, cause crops of Pine Apples to ripen regularly, and without failure, at any appointed period of the year. Some varieties of the Pine Apple appear to me to be capable of acquiring a very high state of perfection under a curvilinear iron roof in the most unfavourable seasons of the year, and the most excellent fruit of the species in my estimation, which I have ever seen, has been that of the St. Vincent's or Green Olive, in the middle of winter; and my guests have, in more than one instance, unanimously coincided with me in opinion.

I have raised as many succession plants as I have wanted (and I have used a very large number comparatively with the extent of my stoves) by placing my suckers and young plants to take root and grow over the flues between the larger plants; but crowns and suckers never emit roots more freely, nor afford better plants, than they do when placed in a common hot-bed.

I often plant suckers without detaching them from the roots and stems of the parent plants, and for the purpose of receiving such roots and long stems, I employ pots which vary in depth from eighteen to twenty-two inches with a cylindrical diameter of eleven inches only. Much time is thus gained, for plants thus raised, if properly managed, will afford good fruit at a year old; and they are capable whilst young of being very closely packed together.

Under a curvilinear iron roof, it will be necessary to shade the Pine Apple Plants during the first bright days of the spring, or the healthful verdant colour of their leaves will be tarnished; and also to shade the plants during the long and

bright days of summer from ten o'clock in the morning to three in the afternoon, or the fruit will ripen with injurious rapidity at that season. For this purpose I employ a net, of the kind I use to cover Cherry trees, doubled.

The gardener, who has never cultivated Pine Apples in a dry stove, should bear in mind that in giving water he should put as much at once into each pot as will moisten the mould to the bottom of it, and avoid watering very frequently.

There are in different parts of England enormous heaps of coal dust lying at the tops of the pits of no value whatever, and in situations where Pine Apples might be conveyed within three days to London by water carriage, and I am perfectly confident that these may be raised by the mode of culture recommended in this, and former communications, at less than half the expence now incurred; and I do not entertain the slightest doubt, that as large, and even larger Pine Apples, may be raised without, than with a hot-bed of any kind. Nothing can be more easy than the act of giving a more regular and uniform warmth to the roots than that which can be given by the ever varying heat of a bark bed; and a sufficiently humid state in the atmosphere of the house may be regularly produced by many different means.*

Some gardeners however, have, as I have been informed wholly failed in attempts to cultivate Pine Apples without the aid of a bark bed; and one case of this kind has come within my own observation. In this (and probably in all others) the failure obviously arose from want of sufficient

* Any person who may be disposed to profit by the foregoing suggestion is at full liberty to inspect my Pine stoves, and shall receive any information, which I can give: and I can with perfect confidence promise him success.

humidity in the atmosphere of the house; for the plants not only grow best, but the fruit acquires, I think, its highest state of perfection when ripened in damp air, provided that there be a sufficient change of it, and that too much water be not given to the roots of the plants. A very dry state of the air in the stove is noxious, I believe, to almost every species of plant, and particularly to the Pine Apple.*

Whenever it is wished that Pine Apples should be produced of very large size, it will obviously be necessary to restrain the plants from bearing fruit till they have acquired a greater age than mine have ever been permitted to acquire; and in such case it will be beneficial to remove the plants annually into larger pots. This, when the pots, as well as the plants, are large, will not very easily be done without danger of injury to the roots. It has been my custom to remove Melon plants of large size; and to preserve the roots of these from injury in transplanting, I have had baskets, of loose texture and coarse workmanship, and consequently of very low price, made to fit the pots from which the Melon plants were to be removed; if such baskets were to be introduced into the pots in which the Pine Apple plants were placed in the autumn of one year, they would remain sufficiently sound till the following autumn to enable the gardener to remove plants of the largest size without any danger of injury to their roots. It will also be necessary when fruit of the largest size is required, to place the plants, at all periods of their growth,

* Very dry air appears to me to be particularly injurious, when it is made to come into contact with the roots through the sides of a porous and unglazed earthern pot: I suspect, owing to causes pointed out by M. Dutrochet; see *L'agent immediat du Mouvement vital*; and *Nouvelles recherches sur l'Endosmose et l'Exosmose.*

at considerable distances from each other, because the leaves of the Pine Apple plants act less efficiently in the generation of sap, in proportion as they are made to take a perpendicular direction; and this direction they are compelled to take when they are laterally much shaded; for the leaves of this plant, like the stems of Potatoe plants, as I have remarked in the last Communication* which I had the honour to address to this Society, are subject to the conflicting influence of gravitation † and of light, the one labouring to give a perpendicular, the other a horizontal direction to the leaves; and the comparative power of one agent encreasing as that of the other decreases.

I shall conclude the present Communication with an account of a very simple and efficient method of destroying the different species of insect that infest the Pine Apple Plant, which I have practised during the last two years with perfect success. Pine Apple Plants are not at all injured by having water at the temperature of 150° of Fahrenheit's scale thrown upon and into them, with a syringe. The Mealy Bug does not appear to be injured by a single washing, or immersion for a short time in water of the above-mentioned temperature; but if the application be repeated three or four times on as many successive days, it wholly

* See page 406 of this Volume.

† The influence of gravitation upon the forms of plants is still greater than I have inferred in my Paper in the Philosophical Transactions upon that subject. M. DUTROCHET having used very superior machinery to that employed by me, discovered, that if a seed be made to revolve upon its own axis, and its axis of rotation made to dip only a degree and a half below the horizontal line, the roots will always take the descending, and the germs the ascending line, of that axis.

disappears. My Gardener has, I have reason to believe, used water of higher temperature than 150° without any injury to the plants; but as hot water, when applied in the way above-mentioned, will operate according to the compound ratio of its quantity and temperature, I would recommend the Gardener, when he first uses it, to apply it to a worthless plant, and not to use water of quite so high a temperature as 150°.

Having some Red Spiders upon the leaves of a Fig tree in the stove, I endeavoured to ascertain the effects of hot water upon these. The first application of it appeared only to render them more alert and active; a second appeared to have diminished their numbers very considerably, and after a third application I could not discern any. Whether they had died, or marched off only, I am ignorant; and the period at which I remove my Fig trees into the open air having arrived, I had no further opportunity of trying the experiment. I applied the water to the mature and somewhat old leaves only of the Fig trees.

Note by the Secretary.

March 30, 1829. During the last season, several specimens of the fruit of the Pine Apple, managed as above described, were sent to the Society by Mr. Knight. They were all, without exception, of the very best quality in point of flavour; they were universally destitute of fibre, and in every respect as perfectly grown as any I ever saw of the same size.

XLIX. *Upon a mode of covering the naked branches of Fruit Trees with New Wood. In a Letter to the President. By* Samuel Spyvee Street, *Esq. of Penryn, Cornwall.*

Read December 2, 1828.

Sir,

Presuming that any experiment relative to the improvement of Horticulture may be acceptable to the Society, I am induced to send you the result of one which I tried this Spring.

It is a fact well known to Horticulturists, that the branches of fruit trees trained against walls, and espaliers, after eight or ten years become naked for about a foot or two nearest the stem, which gives an unsightly appearance to the tree, especially when the branches are trained horizontally; and it is in general difficult to procure blossom spurs, or even wood shoots, in those situations, unless by training a new shoot from the main stem, which cannot always be procured. The idea struck me, that, if I interrupted the sap at a distance from the main stem by ringing the branches, shoots might be produced between the ring and the stem, and the result has proved that my idea was correct. This spring, when the blossom buds were about to burst, I made a ring to the extent of one-fifth of an inch, in the usual way, at the distance of two feet from the main stem, round a branch of a Jargonelle Pear Tree, trained horizontally, which branch had for several years been entirely bare both of fruit spurs and wood shoots; nor was there the smallest appearance of an

embryo bud at the time of ringing. I soon found that a space to the extent of seven inches nearest the ring began to break into buds; at this time (July), there are six fine buds broken and two embryo buds are visible, which I have no doubt will break next spring. The part of the branch nearest the stem, about seventeen inches, is still without a bud; I therefore concluded that six or eight inches should be substituted in future ringings instead of two feet. Another experiment has confirmed this opinion. About the same time I made that on the Jargonelle, I also ringed a branch of a Bergamot Pear Tree, at six inches from the stem, which has at this time six buds broken and four embryos very prominent.

The space which formed the ring is grown over in both branches.

I am, Sir,

your most obedient Servant,

SAMUEL SPYVEE STREET.

Penryn, Cornwall,
July 21, 1828.

L. *An Account and Description of the Species and most remarkable Varieties of Spring Crocuses, cultivated in the Garden of the Horticultural Society. By* Joseph Sabine, *Esq. F. R. S. &c. &c. Secretary.*

Read January 6, 1829.

Hardy bulbous plants have always been a particular object of my attention; nearly thirty years ago I began to form that Collection of them, which on the establishment of the late Nursery Garden of the Horticultural Society at Kensington in 1818, I had the pleasure of presenting to the Society entire. Part of it consisted of a very extensive assortment of Spring Crocuses; these I had obtained from various quarters, many from Holland, several from seed, others from the public Nurseries and private Gardens in the neighbourhood of London, and for some of the most interesting, I was indebted to my late valued and lamented friend Mr. George Anderson, whose rich collection in his garden at East Ham, in Essex, was a never-failing source of liberal supply to every curious Collector. From Mr. Richard Williams, of Turnham-Green, I received also several of much excellence; he has long been a diligent cultivator of Crocuses, and has been fortunate in obtaining from seed, some of the most beautiful of the varieties of C. vernus which exist.

Both before and since the transfer of the plants of the Horticultural Society from Kensington to the Garden at Chiswick, some additions have been made to the collection of Crocuses.

The whole have blossomed in much splendour in the spring months of each year since their removal, and at those times I made such notes and descriptions of them, as with the corrections of the past season have enabled me to lay this communication before the Society.

The different species of Crocus appear not to have attracted the attention of scientific Botanists until a very recent period; Linnæus, in his Hortus Cliffortianus (page 18) published in 1737, separated the Autumnal and Spring Crocuses, but both in the first (1753) and in the last (1762) editions of his Species Plantarum* he made the Autumnal or Saffron Crocus, and the Spring Crocus, varieties (under the names of C. Officinalis and C. Vernus) of his sole species the C. Sativus. To the latter variety he referred all the Spring Crocuses with broad leaves, including the yellow flowering ones, enumerated† by Caspar Bauhin in the two first classes of Spring Crocuses of his Pinax, and as he could not have been ignorant of the different kinds which were cultivated in gardens, and in those of Holland especially, there can be no doubt that it was his intention to consider them all as belonging to his C. Vernus. It is singular, however, that Linnæus makes no reference to Caspar Bauhin's third class of Spring Crocuses, viz. those with narrow leaves.

The only alteration made by Willdenow, in his edition (1797) of the Species Plantarum,‡ in the previous arrangement of Linnæus, was the separation of the two varieties above named into distinct species, the Autumnal one being

* Linn. Species Plantarum, Edit. 1. vol. i. page 36; Edit. 2. vol. i. page 50.

† Bauhin, Pinax, page 65, et seq.

‡ Willd, Species Plantarum, vol. i. page 194.

called C. Sativus, and the Spring one C. Vernus. It is evident from the Works quoted by Willdenow, that he concurred with Linnæus in considering all the Spring kinds as referable to this last Species.

The researches of Botanical travellers in the southern parts of Europe and in the temperate regions of Asia* have proved the existence of many kinds of Crocus in a wild state, which were not known at the time of Willdenow's publication. The list of ascertained uncultivated species is now extensive, and a well executed Monograph of the Genus would be a very acceptable acquisition both to the Botanist and Horticulturist.

A paper of this description was published by Dr. Goldbach, in 1817 in the 5th Volume of the Memoirs of the Imperial Society of Naturalists of Moscow, but the want of full information in some parts in it, as well as subsequent discoveries, make it now unsatisfactory as a whole.

A similar attempt was made in 1826, by Mr. Bouché, in an account of the Genus Crocus, in the 5th Volume of the Linnæa (page 227). He terminates his paper with an announcement of his want of knowledge of nine species of the Genus, it is therefore quite as imperfect as that of Dr. Goldbach.

Mr. Gay, of Paris, it is understood has been long engaged in preparing a Monograph of the Genus, for which no one is better qualified, not only on account of his general science, but from his particular acquaintance with the subject, he having long cultivated the different species of authors, obtained from their native countries, under his own eye in the Garden of the Luxembourg.

* The habitats of the different species of wild Crocus are confined to these two quarters of the Globe.

In 1826, two publications appeared on the Crocuses of Italy, by Italian Botanists; the first entitled, "Descrizione de' Zafferani Italiani," by Dr. BERTOLONI, Professor of Botany at Bologna, was printed in a collection of scientific Italian tracts; the second, by Dr. TENORE, Professor of Botany at Naples, appeared as a separate work in 4to. at Naples, with the Title of "Memoria sulle specie e varietà di Crochi della Flora Napolitana." These were examined and criticised by Mr. GAY in the Bulletin des Sciences Naturelles for July, 1827 (page 346), where the contents of both these Memoirs are very fully set forth, and much information may be derived from the whole.

What I now propose to communicate will not at all I believe interfere with, or destroy the interest in M. GAY's projected Monograph. It is not my design to take any notice here of the Autumnal Crocuses which we have in our Gardens; these are all originally wild, and consequently natural species; whilst those Spring plants, of which I do propose to give an account, may all, with the exception of Crocus pusillus and of the native British C. Vernus, be considered as Garden productions; or if not originally so, they have been so long in cultivation as to have very much deviated from their native types; and the characters of the species, I shall have to observe on, having all, except those of C. pusillus and C. Vernus, been deduced from Garden plants, they will probably be found to differ much from those which belong to any one of the truly wild species.

Those I propose to describe, and under which the varieties in the Garden of the Horticultural Society have been arranged, are C. Susianus, C. sulphureus, C. stellaris, C. lage-

næflorus, C. luteus, C. lacteus, C. biflorus, C. argenteus, C. pusillus, C. versicolor and C. vernus—all, without doubt, with the exceptions above stated, ancient occupiers of the flower border, but only recently distinguished and separated from each other.

PARKINSON in his Paradisus,* first published in 1629, describes twenty-seven kinds of Spring Crocus or Saffron (exclusive of a few sub-varieties to some of his kinds) the whole of which were then known in the Gardens; some of these are now referable to plants I shall have to notice, but it is probable that others are lost, and that several, though still in existence, cannot, from the imperfection of the descriptions, be now properly placed with certainty, under their Garden appellations. These difficulties occur with, and the observations are equally applicable to, the kinds mentioned by MILLER, in the first edition of his Gardener's Dictionary printed in 1731. He there gave the names, and short characters of twenty Spring Crocuses, but in the seventh and eighth editions of the work, the former printed in 1759, the latter in 1768, he altered this arrangement, dividing them into two species and twelve varieties only. PARKINSON and MILLER must be considered the authorities for the Garden Crocuses of their times, in Great Britain.

The Spring Crocuses which had been seen, described, or figured, by the older Botanists, viz. BESLER, CAMERARIUS, CLUSIUS, DALECHAMP, DODOENS, LOBEL, SWERTIUS and others, previous to, and at the commencement of, the Seventeenth century, were collected together by CASPAR BAUHIN in his Pinax (page 65, &c.), in 1623, and formed into three Classes,

* PARKINSON's Paradisus, &c. p. 160.

containing altogether twenty three distinct sorts with sub-varieties to some of the sorts. Several of these are referable without difficulty to our cultivated plants, some are doubtless native plants, which though thus early known have not been distinguished again till lately, others are lost, and some cannot be well made out, or at least not sufficiently so to enable them to be determined.

From the materials thus supplied by CASPAR BAUHIN, with the aid of the works of JOHN BAUHIN, and the collection of Plants in the Royal Garden at Paris, TOURNEFORT * in 1719, formed his List of the Genus Crocus and enumerated thirty-four kinds. These Lists of CASPAR BAUHIN and TOURNEFORT, with those of PARKINSON and MILLER before noticed, with references to the authorities quoted by them, will supply the whole information that can be had of the kinds of Crocuses known or cultivated in the earlier times.

With the assistance of TOURNEFORT's work, WESTON† in 1771, compiled a list of the Genus Crocus, forty of which were Spring flowering ones; several of these were however assuredly not in existence at the period of the publication, and the work cannot be considered as of much authority; it is however proper to mention it when all the writers on the subject are enumerated.

Of the species I propose to notice, C. argenteus and C. lacteus are new, and C. pusillus and C. vernus are the only natural species. The latter, though only noted by LINNÆUS as a variety must be considered as founded by him. C. pusillus was established by TENORE, C. biflorus by MILLER, and C.

* See Institutiones Rei Herbariæ, Vol. 1. page 350, &c.

† Universal Botanist, Vol. 2. page 237.

luteus by LAMARK. The remaining species of this paper, C. Susianus, C. sulphureus, C. lagenæflorus, and C. versicolor, have all been formed, and first distinguished in the different periodical Botanical works, which have in later times been published in this country.

The varieties of Crocus in the lists of the modern Dutch Gardeners, vary from twenty to perhaps double that number, but they have only florists names, they are without descriptions, and are not arranged in any systematic manner, so that those belonging to different Classes or Species are not distinguishable from each other. The names given to Crocuses also, by the Dutch Florists do not seem to be affixed by general consent, since their different catalogues frequently give different names to the same kinds. It is, however, from the Dutch collections that several of our best varieties, especially of those belonging to C. vernus, have been procured.

New kinds from seed are frequently raised both in England and in Holland; possibly by more attention than has hitherto been paid to this part of their cultivation much improvement in the beauty of these flowers may result. It will be seen that some very excellent varieties of the collection which is now to be described, have been so obtained. Crocus vernus sports more extensively, and produces more varieties than any other, but hitherto as far as my observation has extended, a very large proportion of its seedlings are destitute of peculiar merit, and those which can be considered worthy of selection and description are of rare occurrence.

In the year 1809, Mr. HAWORTH published in the Transactions* of this Society, a paper on the cultivation of

* See Horticultural Transactions, Vol. 1. page 122.

Crocuses, with a brief notice of some species and varieties, all garden plants, altogether amounting to thirteen kinds. It is much to be lamented that his description was not extended to all with which he was acquainted, and that he never communicated subsequently an account of the different kinds he knew. No one was at that time, so well qualified as he was, to give a complete account of the whole genus. His paper, in addition to the scientific descriptions, contains very useful instructions for the raising of seedling Crocuses in boxes, a practice in which he had acquired much experience. Mr. Haworth describes nine species; to all of these I have referred, considering eight as distinct, and have placed the other species, C. obovatus, among the varieties of C. vernus, to which it appears to me strictly to belong.

The cultivation and management of Crocuses is not a matter of difficulty; they succeed best in a light dry soil, but do not like frequent removals. Many of the kinds increase rapidly by reproduction of their bulbs, but these blossom well notwithstanding their being left very thick together. The new bulbs are formed above and on the old one, which is only annual, perishing after the production of its progeny. Each old bulb, produces one or more fasciculi or bunches of leaves, and a new bulb is formed at the base of each fasciculus; so that where only one fasciculus is produced, one new bulb only is formed, and the increase of the number of bulbs in each season, depends on the number of the fasciculi of leaves. When they have been taken up, the bulbs should be kept out of the ground as little time as possible; the longer the planting of them is delayed, the more defective will be their appearance in the succeeding season. They may be planted either in

circular patches in the borders, or in rows across narrow beds, and arranged according to their colours, their classifications, or periods of their flowering, as the fancy of the Cultivator may direct. When planted in rows, the roots should be placed in double lines, the two lines being contiguous to each other; the effect to the eye by this is far superior to that produced by single lines. A collection looks best when planted in considerable quantity, and is particularly splendid when several beds are near to each other. A very good appearance is produced by planting a compartment thickly with various kinds, so as to cover the whole bed, in any pattern that may be devised. The disposition of the kinds should be in broad, not narrow stripes, and the colours of the kinds placed next to each other should be well contrasted. When the plants are all in flower the whole resembles a richly coloured carpet.

The earliest kinds shew their flowers in the end of January or beginning of February, sooner or later according to the season; the blossoms of the general mass of the collection are in perfection through March, and the later flowering varieties of C. vernus continue in beauty during the best part of April.

Crocuses require no protection in winter except from mice, which attack them voraciously, frequently destroying the whole of the roots, if they are suffered to continue their depredations unmolested. Rabbits also will eat both the leaves and the flowers of several of the kinds; they are particularly fond of the varieties of C. biflorus. The common House Sparrows, as has been noticed by Curtis, (Botanical Magazine, folio 45) are so fond of pecking the blossoms, especially of the Large Yellow Crocus, that they will soon destroy the

beauty of a collection if they are not kept away; and on this account, a plantation of the roots is best, when situated at a distance from hedges, bushes, or buildings, which may afford shelter to these birds.

The leaves of all the Crocuses are at first short; when the bulbs are in blossom they usually appear shorter than the flowers, but they subsequently elongate much, and many grow to a considerable length before they decay. The practice of cutting away the leaves after the roots have done flowering is improper, this should never be done; they will readily separate from the bulbs at the proper season, and the removing them earlier will materially injure the growth of the bulbs in the present, and the blossoms in the next season. The seed vessels rise above the ground, and the seeds ripen much about the same time that the leaves are in a proper state for removal. At that period the seeds may be gathered, and they should be sown immediately. If the raising the seedlings in boxes, as directed by Mr. Haworth, and the subsequent taking up and planting the roots, be thought too troublesome, they may be at once sown in a dry and warm border in which the young plants may remain till they blossom; and the selection of the sorts to be kept, can thus be made from the original seed bed. Such has been my own practice.

For the better understanding the descriptions of the flowers of the different species, hereafter to be noticed, it is requisite that the nature or mode of the inflorescence of the Genus should be well understood. This has been in part explained both by Mr. Salisbury and Mr. Bellenden Ker, in the Annals of Botany,* but as these Volumes are now of rare oc-

* See Annals of Botany, Vol. 1. pages 120 and 221.

currence, and as some additions to the circumstances noticed in them will be useful, I shall endeavour to explain the subject entirely.

The bulbs produce one or more buds, according to their strength, and every one of these buds forms a fasciculus, as before observed, which, if sufficiently strong to be floriferous,* produces one or more flowers, accompanied by a certain quantity of leaves, the whole being sheathed or enveloped in external membranous coverings, which are always present, in greater or less number, and are of different lengths, the outer ones being always the shortest.

Each separate flower is supported by an underground three-sided scape. Certain species which are here treated on, viz. C. vernus and C. versicolor, have a membranous sheath, which has been erroneously called a spathe, situated at the base of the scape, which sheath extends a little above the summit of the scape, or about on a level with the germen. If the bulb be strong, this sheath envelopes or encloses two complete inflorescences, but it is present if only a single inflorescence is produced. Each flower in all the species has at the base of its germen either one or two bracts, which enclose the flower before it rises and expands. Two of the species herein described, C. vernus and C. lacteus, have only a single bract of this description, whilst the other species have uniformly two. Where two of these bracts exist, one is always included within and opposite to the other. In those species where two inflorescences are included within the membranous sheath above mentioned, each separate flower has, notwithstanding, its own peculiar bract or bracts at the base of the germen.

* The weak buds produce leaves only.

The germen at the time of the flower being produced is situated at a small distance from the bulb, with which it is connected by the scape before mentioned, and it is surmounted by an elongated slender tube, which encloses the style; the stamens are attached to the mouth of the tube, which is enlarged towards the top. The mouth of the tube is hairy in C. vernus; it is smooth in the other species here described. The tube is divided at its top into six segments or petals, which are ranged in two series, one external and the other internal, and each of these series has in all cases distinct and peculiar markings, as well as often differences in colour from the other series; but all the three petals of each series accord with each other. The relation, as to length, of styles and stamens is very variable even in the same species, the latter are either elevated above, equal to, or below the latter in their positions in the flower. The filaments are smooth in some species, pubescent in others. When the blossom has performed its functions, the scape which supports the germen gradually elongates, and ultimately raises it (after it has attained its state of a membranous capsule containing the ripe seeds) to the level, or above the surface, of the ground.

As the circumstances above stated respecting the scapes, sheaths and bracts of the flowers, as well as the pubescence or smoothness of the filaments, are of essential importance in distinguishing the species; and as it is necessary that their characters should be well understood to enable the Cultivator to place any new variety he may obtain in its proper station, I have added a synoptical table of the species, arranged according to their characters in these and other points.

SYNOPSIS OF THE SPECIES.

* *Flowers with a membranous sheath at the base of the scape or scapes, usually enclosing two complete flowers.*

Each flower having two bracts, the external one contracted; the internal one narrow; scape rather long; filaments smooth; orifice of the tube without hairs. . . . . versicolor..10

Each flower having one bract only; scape short; filaments smooth; orifice of the tube hairy. vernus....11

** *Flowers having the sheath at the base of the scape obsolete.*

† *Coats of the Root coarsely reticulated.*

Each flower with two bracts of moderate size, nearly equal; scape short; filaments slightly pubescent. . . . . Susianus...1

†† *Coats of the Roots divided horizontally.*

Each flower with two bracts, the internal one less; scape short; filaments pubescent; petals of equal length. . . . . biflorus....7

Each flower with two bracts, nearly equal, the internal one rather less; scapes long; filaments smooth; petals of equal length. . . . . argenteus..8

Each flower with two bracts, the internal one much narrower; scape short; filaments smooth; inner petals shorter than the outer. . . . . pusillus . . . 9

††† *Coats of the Roots neither coarsely reticulated nor divided horizontally.*

‡ *Each flower with one bract.*

Each flower with one bract; filaments pubescent; roots large. . . . . lacteus 6

‡ *Each flower with two bracts.*

Each flower with two bracts, the external one somewhat ventricose, the internal one narrower; scape long; filaments very short, pubescent; petals upright, of equal length. . . . sulphureus . . 2

Each flower with two bracts, the external one somewhat ventricose, the internal one narrower; scape long; filaments of moderate length, slightly pubescent; petals expanding, the inner ones shorter; roots small. . . . . stellaris . . . 3

Each flower with two bracts, the external of a moderate size, not ventricose, the internal narrow; scape long; filaments pubescent; roots large. . . . . lagenæflorus 4

Each flower with two bracts, the external one large and ventricose, the internal one narrow; scape long; filaments pubescent; roots large. luteus 5

Spring Crocuses.

Index to Plate 11.

Reference to the Plate.

The following are the names of the Crocuses represented in the accompanying Plate; the numbers are indicated in Plate XII. which is an index to the coloured figures.

1. Sulphureus concolor.
2. Lagenæflorus.
3. Lacteus penicillatus.
4. Biflorus Parkinsonii.
5. Argenteus præcox.
6. Versicolor purpureus.
7. ——— plumosus.
8. ——— elegans.
9. ——— urbanus.
10. Vernus plumbeus.
11. —— albus major.
12. —— leuchorhyncus.
13. —— inflatus.
14. —— fucatus.
15. —— pictus.
16. —— Andersonii.
17. —— Sabini.
18. —— Gloriana.
19. —— pulchellus.

Note.

The remainder of this Paper, consisting of detailed descriptions of the Species and Varieties, will form the commencement of the next Part of the Transactions, which is now in the Press.

List of MEDALS, *presented by* ORDER *of the* COUNCIL *of the* HORTICULTURAL SOCIETY *of* LONDON, *from May* 1, 1827, *to May* 1, 1828.

To Captain HENRY DRUMMOND, the Large Silver Medal, for his successful exertions in bringing home from the East, Plants of the Mangosteen.

To Mr. ARCHIBALD GORRIE, C. M. H. S. of Annatt, Perthshire, the Large Silver Medal, for his Paper containing "An Account of Scotch Pears," which has been printed in the Transactions of the Society.

To RICHARD PARKINSON, Esq. of Hereford, the Large Silver Medal, for an extensive Collection of specimens of Herefordshire Apples, transmitted by him to the Society in the autumn of 1827.

To Mr. DAVID DOUGLAS, Gardener to the Lady GRANTHAM, of Putney Hill, Surrey, the Large Silver Medal, for his exhibition on the 18th September, 1827, of Double Dahlias, all of which without exception were flowers highly deserving cultivation, and which were particularly excellent in the dark coloured varieties.

To Mr. THOMAS WELLS, Gardener to JOHN WELLS, Esq. M. P. of Bickley in Kent, the Large Silver Medal, for his exhibition on the 18th September, 1827, of Double Dahlias, which was very extensive and well selected, the greater part being seedlings raised by himself.

To Mr. JOSEPH WELLS, Gardener to WILLIAM WELLS, Esq. of Redleaf in Kent, the Large Silver Medal, for his exhibition on the 18th September, 1827, of Double Dahlias, the particular excellence of which consisted in the superiority of his scarlet flowers, and dark varieties.

To Sir Henry Chamberlaine, Bart. late His Majesty's Consul General at Rio Janeiro, the Large Silver Medal, for his transmission of several new and splendid Plants to the Garden of the Society in the last and previous years.

To Patrick Mathew, Esq. of Gourdie Hill in Perthshire, the Large Silver Medal, for a fine and extensive Collection of Apples from the Carse of Gourie, sent to the Society for exhibition and examination in the winter of 1827.

List of Persons to whom the BANKSIAN MEDAL *has been presented, by* ORDER *of the* COUNCIL *of the* HORTICULTURAL SOCIETY *of* LONDON, *for* EXHIBITIONS *at General Meetings of the Society, from May* 1, 1827, to *May* 1, 1828.

To Her Royal Highness the Duchess of GLOUCESTER, for Flowers of Rosa Sinica, exhibited on the 8th of May, 1827.

To WILLIAM HARDING READ, Esq. for his Collection of Oranges, exhibited on the 8th of May, 1827.

To Mr. WILLIAM GRAY, Gardener to Sir CHARLES MONCK, Bart. for his Lemons, exhibited on the 5th of June, 1827.

To Mrs. EVELYN, for Flowers of different sorts of Roses, produced on budded trees, exhibited on the 19th of June, 1827.

To ROBERT BARCLAY, Esq. of Bury Hill in Surrey, for his Washington Plums, exhibited on the 4th of September, 1827.

To Mr. THOMAS GIBBS of Brompton, for his Apples, Pears and Peaches, exhibited on the 4th of September, 1827.

To Mr. WILLIAM GREENSHIELDS, Gardener to RICHARD BENYON DE BEAUVOIR, Esq. of Englefield House in Berkshire, for his Grapes and other Fruits, exhibited on the 4th of September, 1827.

To Mr. JOHN BROWNSEA, of Jersey, for his White Spanish Onions, exhibited on the 18th of September, 1827.

To CHARLES HOLFORD, Esq. for his Grapes, exhibited on the 18th of September, 1827.

To Mr. JAMES YOUNG, of Epsom, for his Collection of Dahlias, exhibited on the 18th of September, 1827.

To Mr. JOSEPH INWOOD, Gardener to the Countess DE GREY, of Putney Hill, for Double Dahlias, exhibited on the 18th of September, 1827.

To Mr. JOHN SLANN BURGESS, Gardener to RICHARD SANDERSON, Esq. of Brightlinsea near Colchester, for his Collection of Double Dahlias, exhibited on the 18th of September, 1827.

To Mr. Robert Buck, of Blackheath, for his Grapes growing on plants in Pots, exhibited on the 18th of September, 1827.

To Mr. John George Fuller, of Streatham, Surrey, for his Pears and Apples, exhibited on the 18th of September, 1827.

To Mr. Joseph Kirke, of Brompton, for his Collection of Apples, exhibited on the 18th of September, 1827.

To the Right Honourable John Forster, for his Specimens of the Mal Carle, exhibited on the 18th of December, 1827.

To Jesse Buel, Esq. of Albany in the province of New York, for his American Apples, exhibited on the 5th of February, 1828.

To Sadi Ombark Benbey, of Lambeth, for his King Dates, exhibited on the 19th of February, 1828.

To Mr. John Rutherford, Gardener to the Earl of Digby at Sherborne Castle, Dorsetshire, for his Pears, exhibited on the 4th of March, 1828.

To Mr. Hugh Ronalds, of Brentford, for his Apples, exhibited on the 1st of April, 1828.

List of Persons to whom the CERTIFICATE, *in lieu of the* BANKSIAN MEDAL, *has been presented, by* ORDER *of the* COUNCIL *of the* HORTICULTURAL SOCIETY *of* LONDON, *for Exhibitions at General Meetings of the Society, from May* 1, 1827, *to May* 1, 1828.

To Mr. THOMAS GIBBS, of Brompton, for his Apples, exhibited on the 20th of November, 1827.

To Mr. JAMES YOUNG, of Epsom, for his Apples, exhibited on the 20th of November, 1827.

To Mr. JOSEPH KIRKE, of Brompton, for his Apples, exhibited on the 5th of February, 1828.

List of MEDALS *awarded at the* ANNIVERSARY MEETING *of the* HORTICULTURAL SOCIETY *of* LONDON *in the year* 1827.

In order to encourage the exhibition of forced Fruits at the Society's Anniversary Meetings at the Garden, it has been determined by the Council that a certain number of Medals shall be awarded upon each such occasion by judges specially appointed for the purpose.

In 1827 the exhibition took place on the 23d of June; the judges being

Mr. WILLIAM MALCOLM, Mr. HUGH RONALDS,
Mr. SAMUEL KNEVETT, Mr. WILLIAM GREENSHIELDS;

when the following Medals were distributed.

THE LARGE SILVER MEDAL

To Mr. JAMES BROWN, Gardener to the Duke of BUCKINGHAM at Stowe in Buckinghamshire, for the best Fruits, consisting of Pines and Grapes.

THE BANKSIAN MEDALS

To Mr. WILLIAM Mc MURTRIE, Gardener to the Lord ANSON at Shuckburgh in Staffordshire, for Pine Apples and Melons.

To Mr. CHRISTIE DUFF, Gardener to the Earl GROSVENOR at Eaton Hall in Cheshire, for various Fruits.

To Mr. JOHN BOWERS, Gardener to the Lord SELSEY at West Dean House in Sussex, for Grapes, Nectarines, and a Melon.

To CHARLES GOMOND COOKE, Esq. of Upper Poole House in Herefordshire, for a Providence Pine Apple.

To Mr. Thomas Tyer, Gardener to the Lord Ellenborough at Roehampton in Surrey, for Strawberries.

To the Right Honourable Reginald Pole Carew, for Citrons grown in the open air in his Garden at Anthony House in Devonshire.

Medals presented to LOCAL HORTICULTURAL SOCIETIES *within the United Kingdom,*

For the Year 1827.

THE Regulations under which these Medals are distributed having been already printed, and annexed to the present Volume of the Transactions, a repetition of them here is unnecessary.

The Council have much gratification in observing, that the plan acted upon for the first time in 1826, of placing one of their Large Silver Medals annually at the disposal of each of the Provincial Horticultural Societies within the United Kingdom with which they are in communication, has been attended with very beneficial effects. In this their chief object was to encourage merit and talent, which from circumstances was not likely to come within their knowledge by other means; and it cannot be doubted, that if the principle of conferring these Medals in all cases upon Practical Men within the district of each Local Society, and not upon Amateurs, or Persons of Fortune, who have ready access to the Horticultural Society of London, is as steadily pursued as it has hitherto been, the most beneficial results to Horticulture will arise.

The following is a list of the Medals which have been awarded by the Provincial Horticultural Societies for the year 1827.

By the CALEDONIAN HORTICULTURAL SOCIETY to Mr. ARCHIBALD REID, Gardener to the Hon. ROBERT LINDSAY, of Balcarres, in Fifeshire, for his Paper printed in their Transactions, entitled, " Account of a new mode of Planting and Cultivating Fruit Trees, with a view to prevent Canker, and to procure well ripened Fruit."

By the HORTICULTURAL SOCIETY OF DURHAM, NORTHUMBERLAND, AND NEWCASTLE-UPON-TYNE to Mr. THOMAS COOKE, Gardener to THOMAS WENTWORTH BEAUMONT, Esq. of Bradley Hall, Durham, for having gained the greatest number of Prize Medals during the past season, and also for the great beauty and excellence of all his exhibitions during that time.

By the DUMFRIES AND GALLOWAY HORTICULTURAL SOCIETY to Mr. WILLIAM MOFFAT, Gardener to Mrs. HUNTER ARUNDEL, of Barjary Tower, in the County of Dumfries, for having obtained the greatest number of Prizes for the most useful Articles exhibited to the Society in the year 1827.

By the CAMBRIDGESHIRE HORTICULTURAL SOCIETY to Mr. WILLIAM GIMSON, Nurseryman, at Linton, in Cambridgeshire, for the general excellence of his several Productions within the year 1827, which consisted principally of Fruits, Flowers, and Seedling Roses.

By the WINCHESTER HORTICULTURAL SOCIETY to Mr. THOMAS HARDING, Gardener to the Rev. FREDERICK BEADON, of North Stoneham, near Southampton, for his various exhibitions of Flowers in the year 1827, particularly those cultivated in a Stove.

By the ABERDEENSHIRE HORTICULTURAL SOCIETY to Mr. ALEXANDER DIACK, of Mile End, near Aberdeen, on account of the merit of his Communications to the Society during the year 1827; the number of Medals and Premiums which he has gained in the course of the same period; the success which has attended many of his experiments; the perfection to which he has brought a variety of articles from the seed, particularly Strawberries; and his unwearied zeal in promoting the science of Horticulture.

By the GLASGOW HORTICULTURAL SOCIETY. to Mr. WILLIAM STEWART, Gardener to ARCHIBALD BOGLE, Esq. of Gilmore Hill, near Glasgow, for his various exhibitions of Fruits, Vegetables, and Flowers, made to the Society in the year 1827.

By the ROSS HORTICULTURAL SOCIETY to Mr. THOMAS BREESE, Gardener to Mrs. WESTFALING, of Rudhall, near Ross, for his excellence in training Wall Fruit Trees, for his various fine specimens of Fruit and other Horticultural Productions exhibited by him at the Meetings of the Society, and for his general merit and industry.

By the YORKSHIRE HORTICULTURAL SOCIETY to Mr. JAMES BROWN, Gardener to JOHN HEBBLETHWAITE, Esq. of Woodhouse, near Leeds, for his success as a Cultivator of Early Grapes, of rare Exotics, and of Culinary Vegetables.

LIST OF BOOKS AND OTHER ARTICLES,

PRESENTED TO THE

LIBRARY OF THE HORTICULTURAL SOCIETY,

FROM MAY 1, 1827, TO MAY 1, 1828,

WITH THE NAMES OF THE DONORS.

HIS MAJESTY THE KING OF THE NETHERLANDS, F. H. S.

Flora Batava. Nos. 73 to 76 inclusive 4to.

HIS MAJESTY THE KING OF DENMARK, F. H. S.

Flora Danica. Vol. 1 to 10 inclusive and Parts 31 and 32 of Vol. 11. fol. *Hafniæ,* 1766-1827.

L'ACADÉMIE ROYALE DES SCIENCES DE L'INSTITUT DE FRANCE.

Memoires de l'Academie. Vol. 6. 4to. *Paris,* 1827.

AMERICAN PHILOSOPHICAL SOCIETY.

Eulogium on Thomas Jefferson delivered before the American Philosophical Society on the 11th April 1827, by Nicholas Biddle. 8vo.

Eulogium on Dr. William Tilghman delivered before the American Philosophical Society on the 11th October 1827, by Dr. Du Ponceau. 8vo. *Philadelphia,* 1827.

Transactions of the American Philosophical Society held at Philadelphia. Vol. 3. No. 2. 4to. *Philadelphia*, 1827.

SOCIETY OF ARTS.

Transactions of the Society of Arts. Vol. 45. 8vo. *London*, 1827.

THE ROYAL ASIATIC SOCIETY.

Transactions of the Royal Asiatic Society of Great Britain and Ireland. Vol. 1. Part 3. 4to. *London*, 1827.

MR. ROBERT AUSTEN, C. M. H. S.

Forty five drawings of various Double Scotch Roses.

MESSRS. BACKHOUSE, OF YORK.

Catalogue of their Fruit Trees, &c. 12mo. *York*, 1826.

MESSRS BAUMANN AND SONS, OF BOLLWILLER.

Le Bon Jardinier in German (Taschenbuch des Gärtners). 8vo. *Stuttgard*, 1824.

EDWARD BEVAN, M. D.

The Honey Bee, its Natural History, Physiology, and Management. 12mo. *London*, 1827.

MR. WILLIAM BLAND, JUN.

The Principles of Agriculture. 8vo. *London*, 1827.

THE BRISTOL INSTITUTION.

Proceedings of the Annual Meeting of the Bristol Institution in 1827. 8vo. *Bristol*, 1827.

THE MARQUESS OF BRISTOL, F. H. S.

Gallesio's Pomona Italiana. Nos. 1 to 20 inclusive. fol. *Pisa*, 1817-1827.

WILLIAM BULLOCK, Esq.

Journey from New Orleans to New York, with an account of the city of Cincinnati, by William Bullock. 8vo. *London*, 1827.

THE CALEDONIAN HORTICULTURAL SOCIETY.

Memoirs of the Society. Vol. 6. Part 1. 8vo. *Edinburgh*, 1827.

THE CAMBRIDGESHIRE HORTICULTURAL SOCIETY.

The third Report of the Cambridgeshire Horticultural Society. 8vo. *Cambridge*, 1827.

MR. GEORGE VON CARLOWITZ, C. M. H. S.

Verzeichniss der Obst-Sorten iu der systematischen Obstbaumschule im Königl. Sächs. Grossen Garten bei Dresden. 8vo. *Dresden*, 1819.

MESSRS. DICKSON AND CO.

Catalogue of Plants growing in the Nurseries of Messrs. Dickson and Co. at Edinburgh. 8vo. *Edinburgh*, 1827.

JOHN FROST, Esq. F. H. S.

Some account of the Science of Botany, being the substance of an introductory Lecture to a course of Botany delivered at the Royal Institution of Great Britain. 4to. *London*, 1827.

Observations on the properties and effects of the expressed oil of the seed of Croton Tiglium. 8vo. *London*, 1827.

Remarks on the Mustard Tree of the New Testament. 8vo. *London*, 1827.

An Oration delivered before the Medico-Botanical Society of London on the 12th October, 1827, by John Frost. 8vo. *London*, 1827.

THE GEOLOGICAL SOCIETY OF LONDON.

Transactions of the Geological Society of London. Vol 2. No. 2 4to. *London*, 1827.

SIGNOR GIOVANNI GUSSONI, C. M. H. S.

Selectus Seminum ex collectione anni 1825, quæ in Horto Botanico Regiæ Universitatis Panormitanæ pro mutuâ commutatione offeruntur. 4to.

Index Seminum anni 1825, quæ in Horto Regio in Boccadifalco pro mutuâ commutatione exhibentur. 4to.

MR. ANDREAS HARTWEG, C. M. H. S.

Hortus Carlsruhanus. 8vo. *Carlsruhe*, 1825.

DAVID HOSACK, M. D. F. M. H. S.

An inaugural Discourse delivered before the New-York Horticultural Society at their anniversary Meeting on the 31st of August, 1824, by Dr. Hosack. 8vo. *New York*, 1824.

An inaugural Discourse delivered at the opening of Rutger's Medical College in the city of New York, on Nov. 6, 1826, by Dr. Hosack. 8vo. *New York*, 1826.

Observations on the Medical Character, addressed to the Graduates of the College of Physicians and Surgeons of New York at the commencement held on the 4th of April, 1826, by Dr. Hosack. 8vo. *New York*, 1826.

The Practical American Gardener. 12mo. *Baltimore*, 1819.

Address read before the New York Horticultural Society at the Anniversary celebration of the 28th August, 1827, by N. H. Carter. 8vo.

The American Vine Dresser's Guide, by Alphonse Loubat. 12mo. *New York*, 1827.

The American Farmer. Vols. 5 and 7. 4to. *Baltimore*, 1823-25.

Outline of the Linnean System, arranged for the use of the Students of Rutger's Medical College. (Sheet).

MR. CUTHBERT WILLIAM JOHNSON.

Observations on the employment of Salt in Agriculture and Horticulture. 8vo. *London*, 1827.

DR. KREYSIG.

A Catalogue of Plants growing in the Medical Botanical Garden at Dresden. 8vo. *Dresden*, 1827.

MR. PETER LINDEGAARD, F. H. S.

Two oil Paintings, on canvas, of Figs.

MR. JOHN LINGARD.

A philosophical and practical enquiry into the nature and constitution of Timber, &c. 8vo. *Lond.* 1827.

LINNEAN SOCIETY.

Transactions of the Linnean Society of London. Vol. 15. Part 2. 4to. *London*, 1827.

Catalogue of the Library of the Linnean Society of London. 8vo. *London*, 1827.

HENRY FREDERICK LINK, M. D. F. M. H. S.

Elementa Philosophiae Botanicae auctore Hen. Frid. Link. 8vo. *Berolini*, 1824.

Hortus Regius Botanicus Berolinensis descriptus ab Henrico Friderico Link. 8vo. *Berolini*, 1827.

MESSRS. LODDIGES.

The Botanical Cabinet, Parts 121 to 132 inclusive. 4to. *London*, 1827-8.

JOHN CLAUDIUS LOUDON, Esq. F. H. S.

The Gardener's Magazine, Nos. 7 to 13 inclusive. 8vo. *London*, 1827-8.

THE MEDICO-BOTANICAL SOCIETY.

Bye Laws of the Medico-Botanical Society of London. 8vo. *London*, 1828.

PATRICK NEILL, Esq. C. M. H. S.

Considerations relative to Nuisance in Coal Gas Works. 8vo. *Edinburgh*, 1828.

List of Prizes proposed by the Caledonian Horticultural Society for 1828. 8vo. *Edinburgh.*

M. LOUIS CLAUDE NOISETTE, C. M. H. S.

Manuel Complet du Jardinier. Vol. 4. Part 2. 8vo. *Paris*, 1827.

A Drawing of a Double White Camellia.

LA SOCIÉTÉ D'HORTICULTURE DE PARIS.

Annales de la Société d'Horticulture de Paris. Vol. 1. Part 1. 8vo. *Paris*, 1827.

PHILADELPHIA AGRICULTURAL SOCIETY.

Memoirs of the Philadelphia Agricultural Society. Vols. 1 to 5. 8vo. *Philadelphia*, 1808-1826.

Address delivered before the Philadelphia Society for promoting Agriculture at its annual Meetings, in January, 1822, and January, 1823. 8vo. *Philadelphia*, 1822-23.

MESSRS. POPE AND SONS.

A Drawing of a Tulip grown at Handsworth Nursery by Messrs. Pope and Sons.

A Drawing of a Seedling Azalea raised by the Same.

THE ROYAL PRUSSIAN ECONOMICAL SOCIETY OF POTSDAM.

Monthly Journal of the Royal Prussian Economical Society of Potsdam for the years 1826 and 1827. 2 vol. 8vo.

MESSRS. RIDGWAY AND SONS.

The Pomological Magazine, Nos. 1 to 6 inclusive. 8vo. *London.*

THE MANAGERS OF THE ROYAL INSTITUTION.

The Journal of Science and the Arts. New Series 1 to 5 inclusive. 8vo. *London*, 1827-8.

THE ROYAL SOCIETY.

Philosophical Transactions of the Royal Society of London, Parts 1, 2, 3, 4, for the year 1826, and Part 1 for the year 1827. 4to.

THE ROYAL HUMANE SOCIETY.

The Annual Report of the Society for 1827. 8vo. *London*, 1827.

SIR JAMES EDWARD SMITH, Honorary Member.

The English Flora. Vol. 4. 8vo. *London*, 1828.

RICHARD TAYLOR, Esq.

The Philosophical Magazine and Annals of Philosophy. New Series 5 to 16 inclusive. 8vo. *London*, 1827-8.

M. LE CHEV. MICHELE TENORE, M. D. F. M. H. S.

Flora Napolitana, Nos. 1 to 24. Large folio. *Napoli*, 1811-1825.

Memoria sulle specie e varieta di Crochi della Flora Napolitana. 4to. 1826.

Ad Floræ Neapolitanæ prodromum Appendix quinta. 4to. *Neapoli*, 1826.

Catalogo degli Alberi ed Arbusti, &c. del Real orto Botanico di Napoli. 8vo. *Napoli*, 1827.

Catalogus Plantarum Horti Regii Neapolitani ad annum 1813. 4to. *Napoli*, 1813.

Semina anno 1826 collecta, quæ Hortus Botanicus Neapolitanus pro mutuâ commutatione offert. fol.

Flora Medica Universale e Flora Particolare della provincia di Napoli. 8vo. *Napoli*, 1823.

Corso delle Botaniche del Cav. Tenore. Vol. 4, Part 1, sect. 2. 8vo.

J. C. TREVELYAN, Esq.

Essai sur la taille des Arbres Fruitiers. Par une Société d'Amateurs. 12mo. 1773.

G. Gmelin de Novorum Vegetabilium post creationem Divinam Exortu. 12mo. *Tubingæ*, 1749. In the same Volume,

R. J. Camerarii de Sexu Plantarum Epistola. *Tubingæ*, 1749.

MONS. J. P. VIBERT.

Observations sur la Nomenclature et le Classement des Roses. 8vo. *Paris*, 1826.

Essai sur les Roses. Par J. P. Vibert. 8vo. *Paris*, 1826.

M. VILMORIN, C. M. H. S.

Le Bon Jardinier. Almanach pour l'an 1828. 12mo. *Paris*, 1828.

MR. WILLIAM WILKINS, C. M. H. S.

Bradley's Experimental Husbandman and Gardener. Second edition. 4to. *London*, 1726.

MR. JOHN HERMANN ZIGRA, C. M. H. S.

Der Nordischer Blumenfreund. 8vo. *Riga*, 1826.

List of Subscribers to the Formation of the Garden of the Horticultural Society, at Chiswick, from May 1, 1827, *to May* 1, 1828.

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TRANSACTIONS

OF THE

HORTICULTURAL SOCIETY

OF

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VOL. VII.

PART IV.

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ADVERTISEMENT.

THE Committee appointed by the Horticultural Society to direct the publication of the Papers read before them, take this opportunity to inform the Public, that the grounds of their choice are, and will continue to be, the importance and singularity of the subjects, or the advantageous manner of treating them, without pretending to answer for the certainty of the facts, or the propriety of the reasonings contained in the several Papers so published, which must still rest on the credit or judgment of their respective Authors.

It is likewise necessary, on this occasion, to remark, that it is an established rule of this Society, to which they will always adhere, never to give their opinion, as a body, upon any subject either of Nature or Art, that comes before them. And therefore the thanks which are proposed from the Chair, to be given to the Authors of such Papers as are read at the General Meetings, or to the Persons who send fruits, or other vegetable productions, or exhibit Inventions of various kinds to the Society, are to be considered in no other light than as a matter of civility, in return for the respect shewn to the Society by these communications.

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LVIII. *On the Degeneracy of the larger and finer Varieties of Persian Melons, in the Climate of England. By* Thomas Andrew Knight, *Esq. F. R. S. &c. President.* *p.* 584

The Crocuses represented in the accompanying Plate, are some of those hereafter described. The numbers in the Index Plate correspond with the following enumeration of the species and varieties figured.

1. C. sulphureus concolor.
2. C. lagenæflorus.
3. C. lacteus penicillatus.
4. C. biflorus Parkinsonii.
5. C. argenteus præcox.
6. C. versicolor purpureus.
7. C. ——— plumosus.
8. C. ——— elegans.
9. C. ——— urbanus.
10. C. vernus plumbeus.
11. C. vernus albus major.
12. C. —— leucorhyncus.
13. C. —— inflatus.
14. C. —— fucatus.
15. C. —— pictus.
16. C. —— Andersonii.
17. C. —— Sabini.
18. C. —— Gloriana.
19. C. —— pulchellus.

The Spring Crocuses about to be described are divisible into three Classes, thus distinguished from each other.

1st. Spring Crocuses with yellow flowers.

2nd. Spring Crocuses with various-coloured flowers, (not yellow) having the mouths of the flower-tubes without hairs.

3rd. Spring Crocuses with various-coloured flowers, (not yellow) having the mouths of the flower-tubes hairy.

CLASS I.

Spring Crocuses with yellow Flowers.

In this division are included all the Species of Crocus which either produce yellow, or cream-coloured flowers, with their varieties. They are, more or less, early, being nearly all in full blossom before the principal varieties of Crocus vernus shew themselves. The species to be described

are C. Susianus, C. sulphureus, C. stellaris, C. lagenæflorus, C. luteus, and C. lacteus.

1. Crocus Susianus. Cloth of Gold Crocus.

1. C. Susianus vulgaris.
2. C. ——— minor.

This has been called the earliest of the Crocuses; but though a few of its blossoms may appear first, yet C. biflorus precedes it, a few days, in the general production of blossoms. It is, however, soonest entirely out of flower, much before any other kind. I have to particularize two varieties; the first being the most common, and indeed the only one generally known. Neither of them produce flowers very abundantly.

1. *C. Susianus vulgaris.* The leaves are short, narrow, and spread wide on the ground, becoming at length nearly reclinate; they decay earlier than those of any other species. The flowers are very little elevated from the ground, when they expand. The germen is striped with purple, and often, after a time, becomes entirely purple. The tube of the flower is marked at the top with brownish purple stripes. The petals are deep yellow, lanceolate, obtuse, and nearly equal. The outer are permanently revolute, with a brownish purple stripe, or band, occupying the greater part of their back, and finely, but not deeply, feathered at the edges, towards the top. In the first flowers that shew themselves, this stripe is usually entire; but subsequently it appears more divided, and, in some of the latter flowers, these markings are broken into stripes, or feathers. This change has often given rise to an erroneous separation of this into two varieties. The inner petals are marked with a small greenish-purple feathered spot at the base. The anthers are yellow, and are placed low in

the flower; the stigmas are deep yellow, spreading, and about even with the anthers. The bulbs are of tolerable size, rather flattened; they are covered with a netted coat, the reticulations of which are filled up by a membrane, when they are in a state of vegetation. This Crocus produces only a small quantity of seed.

In the Transactions of the Horticultural Society, volume I. page 136, Mr. HAWORTH, in describing this species in 1809, has called it C. revolutus: but the name of Susianus had been applied to it some years (1803) before in the Botanical Magazine, folio 652, by Mr. BELLENDEN KER. In the figure given of it in that Work, the dark markings are too much divided, and the flower too much elevated; the stigma also is made pale instead of deep yellow.

In the fourth Edition of the Hortus Cantabrigiensis, published in 1807, DONN called this species C. reflexus; but, as he also in his List added C. Susianus, it has been supposed that he had two distinct plants in his view; I am inclined, however, to think it was otherwise, and that the mistake thus made, was an oversight of that usually accurate and intelligent Botanist. In the Hortus Eystettensis,* (published in 1613) is a very good figure of C. Susianus, under the description of "Crocus vernus aureus variegatus." It is also figured by REDOUTÉ in the Plantes Liliacées, Plate 293. The representation there is very indifferent; the flower is too small; the marks on the backs of the petals are not properly distinct, and the root is not netted; yet notwithstanding these differences, I have no doubt, that it was the Artist's intention to give a figure of this variety.

* Plantæ Hyemales, folio 2, Fig. 3.

2. *C. Susianus minor.* For the knowledge of this hitherto little known kind, I am indebted to Mr. LINDLEY, who had observed it several years since at Norwich; some roots of it were obligingly sent by Mrs. MACKIE from her Nursery there, to be added to the Society's collection. The leaves resemble those of the other sort, but are narrower, and more upright in growth at first, but after become equally reclinate. The blossoms appear somewhat earlier. The roots correspond. The plant is however smaller and shorter in all its parts; the outer petals have a little less tendency to be revolute, and their yellow is a shade paler; the marks on the backs of the external petals are subject to the same variations; but its flower may be particularly distinguished from the other, by the spot at the base of the inner petals, which in this is smaller, less conspicuous, not so much feathered, and paler.

There may be other varieties of C. Susianus now to be found, for such have doubtless existed; PARKINSON in his Paradisus* mentions four, all of them having netted roots. The first he calls "The best cloth of Gold Crocus:" this is described and represented with stripes on the back of the petals; Fig. 11. page 163. The next is "The second cloth of Gold, or the Duke Crocus," with the colour entire on the backs of the petals. The third is "The pale cloth of Gold Crocus," ‡ having flowers with pale yellow petals, and fainter

* PARKINSON's Paradisus, pages 166, 167; Nos. 24, 25, 26, and 27.

† Had I not great reliance on the accuracy of PARKINSON, I should be inclined to suspect these two varieties as referable to my C. Susianus vulgaris in the different states I have described.

‡ This has been referred by Mr. HAWORTH to C. stellaris, but I cannot agree to the propriety of the reference.

stripes than the first. The fourth is " The cloth of Silver Crocus " which is described as a pale yellowish white, more white than yellow, with pale purple-blue on the tube and bottom of the flower, and having the outer petals striped. Nothing, I believe, resembling this description has been seen, or heard of by cultivators in modern times. If it exists any where in obscurity, its discovery would be most welcome. It possibly would prove a distinct species. I must necessarily refer my first variety to the second of PARKINSON's kinds; but MILLER, in the first Edition of his Dictionary, quotes PARKINSON's first, as the sort then (1731) cultivated. MILLER, in the same Edition of his Dictionary, mentions only the first plant of PARKINSON's above referred to; but gives besides, on the authority of CLUSIUS, " The double cloth of Gold Crocus." In the seventh Edition of the Dictionary, he considers this as arising from some arrangement of the petals of the single flower; but I am satisfied that the double flowering bulb has existed. It is one of the kinds mentioned by BAUHIN, page 66, in his Pinax.

The Cloth of Gold Crocus is given * in the seventh Edition of MILLER's Dictionary; the sort there described is said to have three stripes on the petals, and cannot consequently be applied to either of the varieties above given, but must be considered as referable to PARKINSON's first kind, which is at present a desideratum in our gardens. It is only referred to by WILLDENOW in his Species Plantarum,† as belonging to Crocus vernus. MILLER says it is commonly called the Bishop's

* Crocus (vernus) spathâ bivalvi radicali, floribus sessilibus.

† WILLDENOW Sp. Plant. vol. i. page 195.

Crocus; but I think him wrong in this, for the one described by PARKINSON with that name is a variety of C. vernus.

In the English Flora of my late valued and respected friend Sir JAMES EDWARD SMITH,* the Crocus Susianus, under MARSCHALL a BIEBERSTEINS's name of Crocus reticulatus is stated to be a native of Great Britain, on the authority of Mr. DAWSON TURNER, as having been found wild in the Park of Sir HENRY BUNBURY, at Barton, in Suffolk. Mr. HODSON of Bury St. Edmonds, obligingly sent me roots and blossoms of two Crocuses which were taken up from the above place. These proved to be C. lagenæflorus and C. argenteus of this paper; C. Susianus may perhaps also be found in the same spot, and I have heard that C. luteus likewise grows there. The place where the specimens I received were taken from, is a small spot at no great distance from the Hall, and not above two hundred yards from the present garden. This locality, as well as the diversity of the plants growing on it, may fairly justify the supposition that the whole have been placed there either by design or accident, and that they are not original inhabitants.

2. CROCUS SULPHUREUS. PALE YELLOW CROCUS.

1. C. Sulphureus striatus,
2. ———— striatellus.
3. ———— isabellinus.
4. ———— concolor.
5. ———— albidus.

This species was established by Mr. BELLENDEN KER in the Botanical Magazine, (folio 938) in the year 1806; only one variety is mentioned by PARKINSON; MILLER recognizes

* See English Flora, vol. iv. page 262.

two in the first, and three in the seventh Edition of his Dictionary. These varieties all come into blossom nearly at the same time, after those of C. versicolor have opened, but before any of the kinds of C. vernus are out. Their flowering is soon passed. Their antheræ are nearly without pollen, the leaves of all the varieties much resemble each other, and the description given of the first, excepting as to what relates to the markings and colours of the flowers, is applicable to the whole species which affords scarce any other variation. They all increase rapidly by the bulbs, but do not produce seeds.

1. *C. Sulphureus striatus.* The leaves are narrow, they are upright, dark green, and are about the height of the flower when the blossoms appear, afterwards they grow very long, still keeping their upright character; they do not decay early. The flowers are numerous, they do not expand much. The germen is cream-coloured, and the top of the tube has a brownish purple tinge divided by white lines. The petals are small, pale yellow, lanceolate, concave and narrow. The three outer petals are marked with three brown very neat feathered stripes, the middle one of which is broadest. The three inner petals are a little broader than the outer, and are marked at the base with a brown, slightly feathered spot, terminated by a line running a short way up the petal. At the lower part of the petal within side, the colour is rather darker, giving the appearance of a yellow cup at the bottom of the flower; this is only perceptible when the flower is opened. The anthers are very pale, spreading outwards and pointed; the stigmas are pale yellow, standing much higher than the anthers. The bulbs are small, and are covered with a brown silky coat without any appearance of

being netted, the sheaths of the leaves remain permanent, and form long necks to the roots when dried.

The figure of this variety, published in the Botanical Magazine* in 1806, is very correct; it is there called the "Worst Yellow, or Old Cloth of Gold Crocus." Crocus flavus α, of of Mr. HAWORTH† applies equally to this, and to the three succeeding varieties. This is the "Crocus vernus latifolius flavo varius" of C. BAUHIN; the "Crocus vernus flavus striatus" of PARKINSON;‡ the "Spring Crocus, with yellow variable flowers" of MILLER,§ when he first wrote, and the "Broad-leaved Spring Crocus, with smaller yellow flowers, striped with black,"¶ of the same author, at a subsequent period. The late Mr. DONN, I believe, intended to designate this variety in the fourth and subsequent editions of his Hortus Cantabrigiensis, under the name of C. flavus, or Dark Scotch Crocus. I have heard it called C. stellaris pallidus.

2. *C. Sulphureus striatellus.* Is similar to the preceding, except that it is very indistinctly striped; the brown markings on the tube and petals are not conspicuous; and the feathery stripes on the outer petals are much less perfect. This variety was selected from the preceding by myself, and has not been noticed in any other collection. It appears to be weak, and has but little merit.

3. *C. Sulphureus isabellinus.* In this, the yellow colour is nearly quite free from markings, which are only perceptible

* Botanical Magazine, tab. 938.

† See Horticultural Transactions, vol. 1. page 135.

‡ PARKINSON's Paradisus, No. 23, page 166, and Fig. 10, plate 163.

§ Gardener's Dictionary, 1st Edition, No. 8.

¶ Gardener's Dictionary, 7th Edition, No. 10.

at the top of the tube, very imperfectly so, but sufficiently to prevent its being described as entirely yellow. The roots were purchased some years since at Messrs. WHITLEY and and Co.'s Nursery at Fulham, under the name of Isabella-Yellow Crocus. It flowers rather later than the other varieties, and is weak like the preceding.

4. *C. sulphureus concolor.* *(See Plate* 11. *Fig.* 1.*)* In this every appearance of the brown colour is obliterated, and the uniformity of the yellow is not disturbed by any markings on any part of the flower above the tube, which is white; with this exception, it corresponds with the three preceding. It was figured in the Botanical Magazine,* in 1811, having been previously noticed with the first variety, when that was published in the same work. The representation is good, except that it has the appearance of yellow featherings on the petals, which is not correct; and the stigmas are yellow, not white. It is the "Spring Crocus, with small pale yellow flowers," N°. 7 of the first Edition (quoting C. BAUHIN's "Crocus vernus latifolius flavus, flore minore et pallidiore" as a synonym), and "the broad-leaved Spring Crocus, with a smaller, and paler yellow flower," N°. 9 of the 7th Edition of MILLER's Dictionary.

The petals of this variety, as well as those of the first, from luxuriance, are occasionally divided, and so assume the appearance of being more than six; but this circumstance is not constant, nor is it at all times observable even among a large number of blossoms. I have marked the roots which produced these apparently luxuriant blossoms, and planted them separate from the others, in hopes of obtaining the variety

* Botanical Magazine, tab. 1384.

distinct, but without success; for, in the succeding year, the roots so selected produced flowers of the usual character.

5. *C. sulphureus albidus.* Is paler than the preceding, and is also without any brown marks; the flower has the appearance of having had the yellow colour discharged from the upper part of the petals, which usually seem as if blighted or damaged by weather. The anthers, in this variety, stand somewhat higher, and the stigmas lower in the flower, than in any of the others. Its period of blossoming is a little later than that of the others before described. This is the Crocus flavus β. of Mr. HAWORTH,* and the "Narrow-leaved Crocus, with a smaller brimstone-coloured flower" of MILLER.† It is also the Crocus pallidus of the fourth, and subsequent Editions of the Hortus Cantabrigiensis.

3. CROCUS STELLARIS.

We are indebted to Mr. HAWORTH for the best published account of this pretty Crocus; it was not noticed by any writer before he described it, for I do not consider his reference of it to PARKINSON's Crocus, N°. 26, "The Pale Cloth of Gold Crocus," can be maintained. This account is in the Paper in the Transactions of the Horticultural Society, which has been already mentioned, where it is accompanied by an excellent figure. It has been considered a distinct species, and as such I have retained it; but I must confess that, on comparison of all its essential characters with those of C. sulphureus, I find them so to correspond, that I conceive they will not remain separated. The chief obvious differences

* See Horticultural Transactions, volume 1, page 135.

† See Gardener's Dictionary, 7th Edition, No. 11.

consist in the deep colour of the flower of C. stellaris, in the markings of its petals, and in the disposition of its flowers to expand themselves more freely. Some other minute differences are noticed in the Synoptical Table of the species. Of its origin we are not informed; it might be taken for a seedling from the striped variety of C. sulphureus, if that kind ever produced seeds; or it may have been a mixed production, between C. sulphureus, and C. Susianus; the latter, being seminiferous, may have been impregnated by pollen of the former, and have thus yielded an offspring resembling its male parent in all points, except the brilliancy of its colour, its markings, and its disposition to expand its blossoms; these it would have derived from the female. The Crocus stellaris comes into flower early, soon after C. Susianus, and produces plenty of blossoms, closely set together. The leaves are narrow, numerous, and upright, rising only to the base of the flowers at their first blossoming; they grow long afterwards, and continue green till a later period than those of other sorts. The germen is white, slightly striped. The tube of the flower has six brownish stripes at the top. The petals are a bright rich deep yellow, lanceolate, obtuse, entire, concave, they are never revolute, and do not open much, but are somewhat stellate under bright sunshine. The outer petals have on their backs five brownish purple stripes, the two external stripes being less distinct, and more feathered; the inner petals are broader than the outer, and have an abbreviated, green feathered stripe at their base. The stigmas are very pale yellow, equal, broadish, growing nearly even with the anthers, which are pale yellow, short, and of moderate size. The bulbs are small and multiply rapidly; they are

covered with a shining silky skin, the inner coat being finely netted. I have never observed ripe seeds produced by this kind.

4. Crocus lagenæflorus. Flask-shaped Crocus.

Has been usually considered as identical with the Crocus aureus* of the Flora Græca, but on comparison with the specimen of that species in the Banksian Herbarium, the differences appear so striking that I cannot think them the same, and have consequently adopted the name given by Mr. Salisbury in the Paradisus Londinensis, to the one now under notice. The Wild Grecian Crocus aureus has a smallerflower, with petals more pointed, neither concave nor obtuse, and at the time of blossoming the leaves are very much longer than the flower, which is not the case with this Garden plant. In the Botanical Magazine, folio 1111, this was considered and described by Mr. Bellenden Ker as specifically the same with C. luteus, the Common Yellow Crocus. C. lagenæflorus *(See Plate* 11. *Fig.* 2,*)* comes into blossom early, at the same time with some of the most forward varieties of C. versicolor, soon after C. Susianus, and before any other of the yellow kind. The leaf sheaths are dingy-brown and large. The leaves are few, rigid and upright, broad, scarcely appearing when the blossoms expand, after the flowering they grow long and they remain green late. The flowers are numerous, small and turbinate. The germen is whitish. The tube long and white, but pale yellow at top. The petals deep yellow, short, obtuse, very concave, and much imbricated, expanding

* Prodromus Floræ Græcæ, page 24, No. 85. Flora Græca, vol. i. page 25, Plate 35.

in the sun; the outer narrowest. The anthers are placed low in the flower, they are the same colour as the petals, long, pointed at the top, and spreading wide; the stigmas are yellow, much shorter than the anthers. I have not observed this variety to produce seed. The roots are rather large, even, not angular, their skin resembling that of C. luteus, but less striated.

This was figured in 1808, in the Paradisus Londinensis, tab. 106, with the name of C. lagenæflorus, but it was there made the variety γ. of the species, whilst the plant which is described hereafter as C. lacteus, is taken as the type of the species. Mr. HAWORTH in the succeeding year described* it as C. lagenæflorus α. The figure in the Paradisus Londinensis is very good, except that the anthers are too dark, and the flower not sufficiently high coloured.

I believe that this is a very old inhabitant of our Gardens; it is difficult to preserve and is consequently rare. There is a difference in the hardiness and consequent time of flowering in some roots which I have possessed, but not of sufficient importance to distinguish them as varieties. Those that flower freely should be selected for cultivation.

5. CROCUS LUTEUS. COMMON YELLOW CROCUS.

This is the most common Crocus cultivated, and is generally known by the name of the Dutch Yellow Crocus, it has been many years in cultivation, but I doubt whether it is described by any of the older writers, and consequently conjecture that it must have been introduced since their time. The Yellow Crocuses of the ancient Botanists, whose synonyms have been

* Horticultural Transactions, vol. 1, page 134.

applied to this species, belong as I apprehend to Crocus lagenæflorus; in the descriptions of these no mention is made of any coloured markings on the petals, from whence I infer, that our Common Yellow Crocus is not the kind they allude to. Nothing the least resembling it has been found wild* in any country, it may therefore be concluded to be a garden production. It received its specific name from LAMARCK,† who distinguished it from Crocus vernus, under which name it is found in the Botanical Magazine, folio 45. It was called‡ C. floribundus by Mr. HAWORTH. Being without any account of its origin, we are left to conjecture from what it could have sported. In all the essential characters it so entirely agrees with C. lagenæflorus that I believe we must consider it to have been derived from that species, and if this be admitted it ought to lose its distinction as a separate species. It may probably have been an hybrid production between C. lagenæflorus and C. sulphureus. It very rarely produces seed, but increases most abundantly by its bulbs. It comes into flower with the earliest of the varieties of C. vernus, soon after C. sulphureus, and continues to produce a succession of blossoms profusely for a considerable time. The leaves are numerous, dark green, broad and flat, with a decided white line in the middle, the edges very revolute and with a deep keel, they hardly extend to the top of the flower at first, but grow to a considerable length afterwards, and

* In the Synopsis of the Genus by M. DECANDOLLE in REDOUTÉ's Liliacées, (under Crocus biflorus, vol. v. folio 294) it is stated that it originated in the environs of Belgrade; and LAMARCK, in his Illustrations, gives the Swiss mountains for its native habitat.

† LAMARCK Illustr. vol. 1, page 106, No. 443.

‡ Horticultural Transactions, vol. 1, page 133.

are then spreading; as they elongate they are waved near their end; this appearance is caused by the compression of their tops by the leaf sheaths soon after their points emerge. The germen is cream coloured, sometimes marked at the top with six dark coloured spots; the tube is white, becoming brown at the top, and is there marked with six lines which run into the petals. The petals are large, obovate, nearly equal, bright yellow, opening, but not so much so as to become stellate. They form a fine and shewy flower. The outer petals are marked on the back with feathered olive green lines, the centre one most conspicuous, and extending to the top of the petals, the two next run considerably up the petal, but are very feint and broken, and sometimes do not appear at all; the others being two to three on each side are short, pale and narrow, the mark at the base of the inner petals may be described as one short feather, the centre part of which extends along the petal.

The anthers are pale yellow, and small, producing but little pollen; the stigmas are also pale yellow, and very short. The bulb is large, depressed, slightly angular, and is covered over with a light brown striated skin.

6. CROCUS LACTEUS. CREAM COLOURED CROCUS.

1. C. lacteus concolor.
2. ——— penicillatus.

The two varieties of this species are the least common of any of the cultivated Crocuses; some few years ago they were very rare indeed, and are now only to be found in the gardens of Collectors of curious bulbs. They have hitherto been considered as varieties of Crocus lagenæflorus, but the circumstance of their having only a single bract, as noticed in the Synoptical

Table, will perhaps be henceforward considered a sufficient specific distinction.

C. lacteus concolor. This was first noticed in modern times by Mr. SALISBURY, in the Paradisus Londinensis,* in 1808, when he described it as the variety β. of his C. lagenæflorus; in the succeeding year it was also introduced as the same by Mr. HAWORTH in his Paper,† in the Transactions of the Horticultural Society. It was likewise published in 1808 by Mr. BELLENDEN KER, with a Figure in the Botanical Magazine, Tab. 1111, as C. Mæsiacus, β. or Cream coloured Crocus, the Crocus luteus of this Paper being then considered as the C. Mæsiacus α. A singular instance of want of observation in a writer usually most acute and careful. The Figure in the Botanical Magazine is good; though the flower never expands as is there represented. This Crocus was received into the Garden of the Society from the Botanic Garden at Cambridge as Crocus coriaceus, which name I am informed by Mr. LINDLEY was applied by him to it formerly, though never published. I should have adopted this name which has reference to the leathery thickness of the petals but that I recollect that many years since, Mr. HAWORTH, when he shewed me this plant in his garden at Little Chelsea, though he had published it only as a variety of C. lagenæflorus, then called it C. lacteus, which appellation is certainly appropriate, and has the claim of priority.

This Crocus flowers tolerably freely; it blossoms soon after C. lagenæflorus, and continues to produce flowers till nearly every other kind, except the late varieties of C. vernus have

* Crocus lagenæflorus, B. Paradisus Londinensis, page 106.

† Horticultural Transactions, vol. 1, page 134.

ceased to blow. The leaves are narrow, short at first, they grow rigidly upright, then become long, remaining green late. The germen, and every part of the flower are cream-coloured, except the mouth of the tube, which is tinged with dull pale yellow, verifying the observation (of Mr. Haworth I believe) that every one of the Garden Crocuses, except those referable to C. vernus, has more or less of yellow in the lower parts of the petals. The tube is long, and consequently elevates the flower, which is fusiform, before it expands; the petals are somewhat concave; the inner ones are shorter than the outer. The stigmas are upright, small, and are much shorter than the anthers, which are long, thin, pale yellow, and spreading. It produces good seeds. The roots have a strong similarity to those of C. lagenæflorus.

2. *C. lacteus penicillatus. (See Plate XI. Fig. 3.)* This is perhaps the most interesting of the Crocuses which are cultivated, differing from the other variety of the species, by the elegant stripes on the base of the outer petals. It is the Crocus lagenæflorus α.* of Mr. Salisbury and the C. lagenæflorus γ.† of Mr. Haworth. The leaves are like the preceding, but somewhat more numerous. The leaf-sheaths are long. It produces its blossoms nearly as early, though after the preceding, and continues in flower as late; the tube is less elongated, and consequently the blossoms are not so elevated. The germen has six small spots on its top, and the upper part of the tube is marked with six faint bluish-green lines; three of these correspond with the centre of the outer

* Paradisus Londinensis, page 106.

† Horticultural Society's Transactions, vol. 1. page 134.

petals, extend up them, and form the middle one of a set of blue-feathered lines; this middle one is the longest, and reaches two-thirds up the petals; the two next are half as long, and smaller; the two outer ones are very faint. The petals are longer than those of the preceding, and though of the same colour, have not quite the same thickness of substance; the inner petals are broader. The stigmas are as in the other variety, shorter than the anthers, which are yellow and broad. It produces plenty of seed. The roots are like those of the other kind. A good figure of this variety was published by Dr. Sims in 1825 in the Botanical Magazine, Tab. 2655, under the name given to it by Mr. Haworth and Mr. Salisbury.

CLASS II.

Spring Crocuses with various coloured Flowers (not yellow) having the mouths of the flower tubes without hairs.

To this division belong the plants ranged under the two older species of our gardens, C. biflorus and C. versicolor, and the two more recent species C. argenteus and C. pusillus. They come early into flower, and may be said generally to precede in blossoming the varieties of C. vernus. They have all a more or less agreeable fragrance, stronger in C. versicolor than in the others, and besides their accordance in the character of the mouth of the tube above noticed, as distinguishing them from C. vernus and its varieties, have feathered stripes or markings in their external petals.

7. CROCUS BIFLORUS. SCOTCH CROCUS.

1. C. Biflorus communis.
2. C. ——— Parkinsonii.
3. C. ——— stigmatosus.

I have not been able to discover the reason why this has been called the Scotch Crocus. The apparent authority for the appellation is MILLER, who in the first Edition of his Dictionary in 1731, says it is commonly called "The Scots Crocus." The specific name biflorus has been also derived from MILLER; in the seventh Edition of the Gardener's Dictionary, published in 1759, this is placed as a species with the following character, "spatha *biflora* corollæ tubo tenuissimo," which is further explained by the statement that it "rises with a few very narrow leaves, which are together with the flower buds closely wrapped round with a spathe or sheath, out of which arise two flowers." When the plant was published in the Botanist's Repository, it was called C. biflorus, certainly without much examination, for, if MILLER's description be taken strictly, what he calls the spathes are the leaf-sheaths, which in all the species of Crocus, when in a healthy state, envelope more than one flower, and therefore could not be peculiar to this; and if the term spathe had been applied by the author of the Repository to the sheath at the base of the scape, then the description would not have been referable to this species, in which this sheath is obsolete.

MILLER makes no mention of the singularly circular horizontal division of the covering of the root, nor is it noticed either in the description or figure of the Botanist's Repository, though it is well described by PARKINSON. This

character induced Mr. HAWORTH in the Transactions of the Horticultural Society* in 1809, to call it C. circumcissus, a name most assuredly very apposite, though the first on account of its priority,† notwithstanding its erroneous foundation is retained. Of its being distinct from C. vernus, there can be no doubt, though in the new Edition of MILLER's Gardener's Dictionary, Professor MARTYN makes it only a variety of that species.

The varieties of Crocus biflorus are the first to appear in the Spring, their blossoms preceding those of C. Susianus, the earliest have some flowers open in the end of January if the season is mild, and all are in full flower in February; they have an agreeable but not powerful scent, and the following common characters,—the outer coats of the roots are circularly divided, as already mentioned; their leaves are narrow, spreading and long; the petals white or nearly so, with brown or purple featherings on their external ones; the insides of the flower white, except the bottom which is tinged with yellow; the anthers pale yellow, and of moderate size; the stigmas deep orange and conspicuous.

1. *C. biflorus communis. Scotch Crocus with brown leaf-sheaths.* This is the most common in our gardens. It comes into flower later than the other varieties of the species. The leaf-sheaths are much swollen, they are brownish

* Volume 1, page 137.

† Mr. HAWORTH in the Paper referred to, has given new names to several of the species he described, but, though these are certainly all equally as good as, and in some cases preferable from their fitness to those formerly established, it is impossible that they can be adopted without violating the rule adhered to by all Botanists of good authority, of retaining the name given to any species by its first describer.

yellow, especially at their tops. The leaves at the time of inflorescence are longer than the flowers, they are not numerous, they are at first upright, but after a time when they become elongated they spread over the ground; they decay early. The germen is white, and the tube of the flower is pale lilac on the top. The petals are pure white, oblong, concave and obtuse, in decay assuming a bluish tinge, the outer are emarginate, (which is not the case in the other varieties) at first cream-coloured, with five distinct purple feathered stripes extending their whole length, with two narrow short stripes besides on each side; the inner petals are broadest, and have at the base a dull greenish purple spot, feathered and pointed at its apex; the yellow colouring at the bottom of the flower within, is also seen externally. The stigmas are nearly entire, and extend a little above the tops of the anthers. It produces seeds freely. The bulbs are of moderate size, roundish; the outer coat is pale chesnut, the inner a shining paler brown. The bud on the root is yellow. The "Crocus vernus striatus vulgaris, or, The ordinary striped Crocus" of PARKINSON's Paradisus, N°. 10, page 162, and of the first Edition of MILLER's Gardener's Dictionary, has been usually referred to this, but as it is represented to have only three stripes on the back of the outer petals, it more properly belongs as a synonym to the next variety. This was first figured (in 1804) in the Botanist's Repository, tab. 362, but the stripes of the petals are there very irregularly represented. The figure in the Botanical Magazine, tab. 845, published in 1805, is good. C. biflorus is figured by REDOUTÉ in his Plantes Liliacées, Plate 294, but with so little attention to correctness that it is not

possible even with the assistance of the description, to ascertain which variety is intended to be represented.

2. *C. biflorus Parkinsonii. (See Plate* XI. *fig.* 4.*) Scotch Crocus with white leaf-sheaths,* is the variety mentioned in the Botanical Magazine, fol. 845, as known to Mr. SALISBURY, it comes the earliest into flower of the three varieties, and blossoms more freely than the first. This, as I have noticed above, is the "Ordinary striped Crocus" of PARKINSON and MILLER. The leaf sheaths are white. The leaves are narrower than those of the preceding, and are rather more numerous. The petals are white, but not so pure as in the preceding, they having sometimes a slight lilac tinge; the three outer are much more cream-coloured, and have only three purple stripes, of which the middle one is but slightly, whilst the two outer are very much, feathered on their outer side, the spots at the base of the inner petals are narrower, extending higher in the middle part of the petal, and are more uniformly feathered, the stigmas are more elevated, more divided, and of a deeper colour. It produces seeds freely.

3. *C. biflorus stigmatosus. Scotch Crocus, with elongated stigmas.* This is similar to the first variety with the following differences. It flowers more freely and earlier. The leaves are at first longer, more diffuse, and they are the broadest of the three varieties. The petals are larger, subject to be somewhat deformed and then appear emarginate; the stripes on the backs of the outer petals are not like those on either of the others, they are five, the two outer being rather undefined, and more feathered. The stigmas are visible at the top of the flower before it expands, and are

nearly or quite as long as the petals, extending much above the anthers; they are very deep orange, large, and are sometimes four in number, with a corresponding multiplication of the petals into eight, viz. four outer and four inner. It seldom produces seed.

8. Crocus argenteus. Silvery Crocus.

1. C. argenteus Batavicus.
2. C. ——————— præcox.

C. argenteus Batavicus, was received by me some years since from Holland as Crocus argenteus variegatus. It is distinguishable from C. biflorus by the length of its flower scapes, and by its filaments being destitute of pubescence, and generally by the flower being of smaller size. It has much resemblance to the C. pusillus of Italy, and may probably have been derived from it, or may be a native of some other country sufficiently remote to account for the difference between the two. It certainly has more the appearance of a wild natural species than any of the garden kinds which I have had under my notice. I have however made it distinct, leaving it to future enquirers to unite it with C. pusillus, if it shall appear proper to do so. The leaves are very narrow and spreading, short at first, but subsequently extend widely on the ground. The flowers are small, and are produced abundantly and early. The tube of the flower is rather more purple at the top, and there is less of yellow at its mouth than in any of the varieties of C. biflorus. The petals are within of a delicate diluted lilac colour, the outer are narrower than the inner, and have three feathered stripes. The stigmas are orange, elevated above the anthers. It produces

only a few seeds. The bulbs resemble those of C. biflorus, but are smaller.

2. *C. argenteus præcox. (See Plate* 11. *Fig.* 5.) This beautiful and valuable variety was a seedling raised by myself from the last; it agrees with it in most points, but the petals are a little narrower, and have more of the lilac tinge. Its leaves spread rather more over the ground, and it yields seed plentifully. Its peculiar merit is that of producing its blossoms the first of all the Crocuses, the flowers are in perfection when those of every other variety have scarcely risen from the ground.

9. Crocus Pusillus. Small Crocus.

This pretty little Crocus is a native of Italy, from whence it was sent to the garden of the Society by Professor Tenore, of Naples, who first described * and named it. It was received from him in September 1824, and flowered in the Spring following. It has a strong affinity to C. biflorus, and it is not unlikely that the varieties of that may be garden derivations from it, and probably all may be reducible to one species. There are however differences which appear in the Synoptical Table, which have induced me for the present to keep C. biflorus, C. argenteus, and C. pusillus separate. C. pusillus produces a moderate quantity of flowers early in the season, at the same time as C. biflorus, but later than C. argenteus. The leaves are very narrow, rather spreading, and are longer than the flower when it opens. The whole flower is very small; the tube is faintly marked with lilac lines; the petals are concave, the three outer white, marked with three lines, the

* Tenore Cat. Hort. Neap. 1813, page 31.

middle one narrow, without featherings, the outer ones broader, and neatly feathered towards the outer edges of the petals; the inner petals are ovate, and pure white; the bottoms of the petals within are yellow. The stigmas are pale orange, longer than the anthers, which are yellow. The roots resemble those of C. argenteus. A figure of C. pusillus has been published in Sweet's British Flower Garden, tab. 106; from bulbs also derived from Professor Tenore. It will be observed on reference to this figure, that the above descriptions of the markings of the petals do not agree with the representation given.

10. Crocus versicolor. Party-coloured Crocus.

This was first brought into notice as a species by Mr. Bellenden Ker (then Mr. Gawler,) in the Botanical Magazine,* in 1808; I have attached his name to the variety there figured, which was of course his type, and have therefore placed it at the head of my arrangement. Mr. Haworth subsequently, in the Transactions† of the Horticultural Society, called the species Crocus fragrans. The scent of all the species is very pleasant, but I think it more resembles that of the Cowslip than of the Violet, with which it has been compared by Mr. Ker. The blossoms of this species have occasionally, though very seldom, eight petals, and four stamina; but that anomaly is not confined to any particular variety.

The specific name of versicolor was adopted from Parkinson, who, in common with the Botanical writers who preceded him, applied the term to designate the stripings at

* Botanical Magazine, tab. 1110.

† Horticultural Transactions, Vol. 1 page 136.

the back of the outer petals; his "Crocus vernus albus polyanthos versicolor," No. 7, page 162, and Fig. 4, page 163, and his "Crocus vernus albus versicolor," No. 8, have been both considered to be referable to some varieties of C. versicolor. There were two varieties known to MILLER in 1731, which in the first edition of his Dictionary are thus designated, No. 11. "The Party-coloured Crocus, with many flowers," which is the same as the first of PARKINSON's, mentioned above; and No. 18. "The Broad-leaved Spring Crocus, with a small flower of a pale colour on the outside, with purple stripes, and the inside of a pale blue colour." These ancient plants belong to C. versicolor; but it is impossible with the imperfect description we have of them to refer them to any of our varieties.

The seedlings of this species are much disposed to vary in the colour and markings of the blossoms, and it is probable if they are much attended to hereafter, that superior varieties will be very extensively obtained. I have arranged those which I propose to describe in four sections, under one of which possibly all future productions belonging to the species may be referred. The general external characters of the species are as follow;—the leaves spread widely and are not very strong, some are however more upright than others. The blossoms are small and appear early, they are more or less sweet-scented, with a tinge of yellow at the mouth of the tube; the petals varying in colour, but the external ones are more or less striped and feathered. The germen is striped with six purple lines; the anthers are yellow, strong, large, and stand high; the stigmas are bright coloured and conspicuous. Most of the varieties produce seeds tolerably freely.

The roots are rather large, ovate, and covered with a coarse ragged pale-brown skin. The kinds described must be considered to possess the above characters unless their differences are particularly noted.

Section I.

The varieties in this have much resemblance to each other, their blossoms having a pale ground colour, which may be almost considered as grey, and the markings or lines are tolerably distinct.

1. C. Versicolor Gawleri.
2. ——— similis.
3. ——— neglectus.

1. *C. versicolor Gawleri.* This is the kind figured as the type of the species in the Botanical Magazine, as above referred to; for the notice of it we are indebted, as I have stated, to Mr. Bellenden Ker. It flowers sparingly, rather late, and does not open its petals freely. The leaves are few, narrow, short at first, but spread afterwards. The tube of the flowers has six faint lilac lines. The outer petals have a dull white ground, with three fine irregularly shaped purple feathered stripes, the middle one the broadest and darkest, the two exterior, and top of the middle ones, feathered; the inner petals have three narrow dark lines accompanied with featherings, indistinctly marked on a white ground, the markings becoming pale purple at the top; the insides of the petals are finely lined, feathered, and tinged with lilac; the markings, on the outer petals especially, are subject to variation, being dissimilar in different flowers; the featherings are in some cases coarser than usual, and the upper parts of the middle marks are sometimes particularly broad.

The stigmas are unequal, deep orange, and shorter than the anthers.

2. *C. versicolor similis.* The blossoms are smaller and later than the preceding, and produced less freely, they also expand less. The foliage is narrow, continuing green long. The markings on the outer petals are irregular, the middle ones longest, sometimes feathered at the top, sometimes not; the two side stripes or marks are short, and slightly feathered on their outer edges; the ground is nearly white; the inner petals are marked at the back like the preceding, but have a lighter ground; the inside of the petals is nearly similar but paler. The stigmas and anthers are also similar.

3. *C. versicolor neglectus.* This is perhaps the best variety of those belonging to this Section. The leaves are strong, long, and grow upright, they remain green late. The flowers are larger, with more distinct markings on the outer petals, of these the middle mark is broader and more conspicuously feathered; the ground of the petals is also a clearer white; the inner petals are not so much stained or run with colour, and have three very fine purple lines on them, the outside ones having long obscure featherings; the inside of the whole shew the markings through. The stigmas are orange, and shorter than the anthers.

Section II.

Contains those varieties whose blossoms are very distinctly marked with dark stripes or featherings. The most beautiful of the species will be found amongst these:

4. C. versicolor purpureus.
5. ——— plumosus.
6. ——— venustus.
7. ——— elegans.

4. *C. versicolor purpureus.* (*See Plate* 11, *Fig.* 6.) Is very early in the production of its flowers, which are particularly beautiful. The leaves are abundant, rather broad, rigid, spreading, and continue green late. The tube of the flower is indistinctly striped with lilac at the top. The petals are short, small, equal, concave, and obovate; the backs of the outer almost entirely covered with a broad dark purple feather, having two whitish stripes dividing it longitudinally in the middle; the inner petals are pale purple at the top, and white below, with three short feathered stripes, the middle one darkest and longest; the insides of the six petals are lilac, paler towards the bottom; the outer are darker, all showing the internal markings transparently through. The stigmas are deep orange, usually nearly equal to, but sometimes shorter than the anthers. The stigmas are occasionally not produced at all, and the anthers are also frequently abortive. This variety does not produce seed.

5. *C. versicolor plumosus.* (*see Plate* 11, *Fig.* 7.) was raised from seed in my garden at North Mimms; it is by far the most beautiful variety of the species which I am acquainted with. It blossoms late. The leaves are at first short, becoming afterwards long, they are broad, grow upright, and remain green late. The tube of the flowers is marked at the top with purple lines; the outer petals have one broad deep purple stripe, divided by two white lines; the stripe is very deeply and distinctly feathered, extending itself quite to the edges; the inner petals are shorter than the outer, with three paler feathered marks spreading over a pale ground, and are whitish at the bottom. The insides of the petals are very beautiful, for though the featherings on them are not bright, nor dis-

tinctly defined, yet as they extend over the whole of each, they are peculiarly striking. The stigmas are a deep saffron colour, and broad, shorter than the anthers.

6. *C. versicolor venustus.* Roots of this variety were presented to the Society by Mrs. Mackie of Norwich, with the name of C. fragrans reflexus, which name was probably derived from the Botanic Garden at Cambridge. The flowers are produced early. The leaves are broad, upright, rather long and spreading. The tube is marked with dark purple lines, which are continuations of the markings on the petals. The outer petals have three distinct purple lines on a pale lilac ground, the middle one is broadest, and but little feathered, it is the darkest. The inner petals are marked also with three lines, having lilac featherings extending to the edges of the petals, the space between the lines being the only part not occupied with the featherings. The insides of the petals are marked with three lines with extending featherings, those on the inner series of petals are a little paler. The stigmas are deep orange, and are shorter than the anthers. Does not produce seeds.

7. *C. versicolor elegans.* (*See Plate* XI. *Fig.* 8.) Comes rather late into flower, but earlier than the preceeding. The leaves are spreading, narrow and numerous, continue green late. The flowers stand high in consequence of their tubes being long, they are not abundant, but when blown are very perfect. They are larger and remain later in bloom, than those of any other variety of C. versicolor. The tube of the flower is very faintly marked with narrow lines. The petals are large, the outer with three broad feathered purple stripes on a pale ground, the middle one darkest, the inner with

three smaller stripes less strongly marked; the upper part of the petals especially of the inner ones is tinged with lilac; the insides of the petals shewing the featherings very beautifully. The stigmas are deeply divided, and of the same length as the anthers. This kind produces abundance of seed.

Section III.

Contains those varieties which have the ground colour tinged with lilac or pale purple, and are besides striped.

8. C. versicolor violaceus.
9. ——————— Haworthii.
10. ——————— lineatus.

8. *C. versicolor violaceus.* This comes very early into blossom immediately after the variety called purpureus, and produces abundance of flowers. It was received under the name of C. versicolor floribundus, from the Nursery of Mrs. Mackie of Norwich, but that name had been before fixed to another variety. The leaves are decumbent, of moderate breadth, and decay early, at the time of flowering they are rather longer than the flower. The top of the tube of the flower is marked with pale purple lines, and the lower part of the flower above the tube externally is more tinged with pale yellow, the effect of the internal colour, than in any other variety. The petals are somewhat concave, they are nearly alike, being all on both sides tinged with lilac or violet colour, having featherings not very distinctly marked, the whole appearing as if the colour had run; but at the lower parts of the petals the markings on the back are darker and more distinctly defined. The stigmas are deep orange, small, shorter than the anthers. Does not produce seeds.

9. *C. versicolor Haworthii.* Comes into flower about a week after the preceding, and it is very productive of flowers. The leaves spread wide, but are not decumbent, they are broader and less numerous than in the preceding, and remain green late. The flowers are very abundant and overtop the leaves; which is not the case in any other variety of C. versicolor. The tube of the flower is marked at the top with faint dull purplish lines. The flower is large, obovate, or egg shaped; the bottom parts being much tinged with yellow. The petals are paler than in the variety called violaceus, the three feathered stripes on each petal are narrower, and less distinct, particularly so on the lower parts of the petals which are white, in the upper parts which are purplish, the featherings become mixed or run; the inner petals have nearly the same markings as the outer; the inside of the whole is very beautiful, but less feathered than in the preceding. The stigmas are deep orange, unequal, broad at the top, shorter than the anthers. Abundance of seeds is produced by this variety. It agrees perfectly well with the description by Mr. HAWORTH of the C. fragrans, given by him in the Horticultural Society's Transactions, Volume 1, page 137; it is therefore named after him; no one deserves such a compliment more richly.

10. *C. versicolor lineatus.* Is very abundant as well as early in flowering. The leaves at first are long, and afterwards spread much. The top of the tube is marked with twelve brownish purple lines. The general colour of the petals is neither vivid nor distinct. On the outside of the three outer petals are three narrow purple lines, the middle one of which runs to the top of the petal, the side ones extending only half way up it. The middle one is not much

feathered, the two side ones are rather the broadest and are feathered towards the outer margin. The insides of the petals are pale lilac, and finely marked with purplish veins. The stigmas are orange, shorter than the anthers. It produces seeds, but not abundantly.

Section IV.

Contains those varieties, the ground of whose petals is white, the outer petals having more or less of stripes and featherings.

11. C. versicolor floribundus.
12. ——————— pectinatus.
13. ——————— Morleon.
14. ——————— inconspicuus.
15. ——————— stellatus.
16. ——————— propinquus.
17. ——————— affinis.
18. ——————— urbanus.

11. *C. versicolor floribundus.* Was received in the year 1823 from Holland, in a small collection sent by Mr. Arie Cornelis Van Eden to the Horticultural Society. The name of Morleon came with it, but this is not the kind to which I believe that appellation properly belongs. This comes into flower between the earliest and latest, and produces abundance of blossoms, it is a very superior variety, by far the finest of all. The flowers stand high, are of considerable size and very fragrant. The leaves are at first, more erect than usual, they differ much in appearance from the rest of the species, they subsequently become long, and spreading. The tube of the flower is very thick, the upper part marked with six purple lines extending some way down the tube, and with shorter intermediate lines. The outer

petals have a white ground with three broad feathered stripes, the middle one is narrow below and widening to the top, the side stripes are broad and feathered towards their outsides; the white space between the feathered marks is narrow. The three inner petals are broader and shorter, white with a feathered line, running along the whole centre nearly to the top, and with two short feathered lines, paler than the middle one, on each side; the inside of the petals is white, shewing the markings through, as if transparent. The stigmas are deep orange, unequal, broad at the top, larger than the anthers. It produces seeds sparingly.

12. *C. versicolor pectinatus,* was raised from seed in my Garden at North Mimms. It flowers about a week after the earliest, not abundantly. The spathes are very long, rising above the tube of the flower. The leaves are broad, not very long or numerous, spread much and decay early. The flower is lightly marked with six faint purple lines. The tube of the petals are narrow, concave, obtuse, and nearly equal, the ground being white, and the lower parts tinged with yellow, deeper than usual, the outer petals are marked with three narrow dark purple lines, from the exterior edges of the outer, and the tops of the middle short featherings of the same colour diverge; the inner petals are marked with three faint lines, the inside of both is white, shewing the markings through. The stigmas are orange, unequal, longer than the anthers, which are of small size. It seeds freely.

13. *C. versicolor Morleon.* Came to me from Holland many years since, with the name now attached to it; but that seems to be applied without much attention to accuracy, for the variety which I have called floribundus had it also.

It blossoms after the first period of flowering, and rather abundantly, but not so much so as some others of the species. The leaves are narrow, rather long, numerous, spreading but not decumbent, and decay early. The tube of the flower is marked with pale lines. The ground of the petals is white, the three outer being marked with three purple stripes, of which the middle one is the longest, running to the top of the petal, the featherings on them are slight and do not extend to the margins; the inner petals are also marked with three faint lines, less conspicuous than those on the outer petals, and which extend only as far as the middle of the petal; the insides, with the exception of the yellow at bottom of the whole are white, and transparent, shewing the featherings on their outside. The stigmas are pale orange, longer than the anthers. It produces abundance of seed. This is the kind described by Mr. HAWORTH in the Transactions of the Horticultural Society, Vol. 1, page 137, as his Crocus fragrans β. It came in one collection from Holland, with the name of Cloth of Silver Crocus, but the Crocus to which that name truly belongs has a netted root, and cannot therefore belong to this specics.

14. *C. versicolor inconspicuus.* Was also a seedling raised in my garden at North Mimms, probably from the Morleon. The leaves are few, broadish, not long, very decumbent, and decay early. It comes into flower rather earlier than the Morleon, which it much resembles, except that the flowers are larger, and the stripes altogether paler and less feathered. The petals are obovate and concave; the centre line on the back of the outer petals is the darkest, the two side ones are fainter, and there are obscure rudiments of two other lines outside of those, making an appearance of five lines in all. The

yellow at the base of the petals is deep coloured. The stigmas are unequal, and stand above the anthers. It seeds freely.

15. *C. versicolor stellatus.* Was sent to the Society's garden from the Nursery of Mrs. Mackie, at Norwich. It flowers rather late. The leaves are numerous and long, spreading, but not decumbent, pale, and keep green late. The blossoms are small. The tube slightly marked with pale purple lines. The petals lanceolate, and when expanded have a very starry appearance. The inner petals are the same length as the outer; the backs of the three outer petals are marked with three purple lines, the middle one being very narrow, darker, and not feathered; the outer ones are paler, and feathered on their outer edges; the inner petals have three very narrow faint lines, the centre one the longest. The stigmas are orange, thick, and stand higher than the anthers. Produces seeds freely.

16. *C. versicolor propinquus.* Is a seedling, raised by myself from Morleon, which it much resembles, except that it is later in flowering, and that the markings on the petals are not so decided, nor so much feathered. The leaves are few, not long, broadish, spreading, but are not decumbent. It is not very productive of flowers. Produces plenty of seeds.

17. *C. versicolor affinis.* Resembles Morleon, except that the stripes on the outer petals are much more faint, and not so distinct, but broader and more feathered; it is a little later coming into flower. The leaves are numerous, long, and spreading. The blossoms are larger than those of the Morleon; on the external petals is an appearance of five pale stripes all feathered, and seeming as if their colours had run. The inner petals are smaller, with very faint lines. The inside of the

petals is white, with the yellow stain appearing at the bottom. The stigmas are orange, and shorter than the anthers. It does not produce many seeds.

18. *C. versicolor urbanus.* (*See Plate* 11, *Fig.* 9.) This is the nearest to white of the whole collection, it is the Urbanus, or Cream-coloured Crocus of the Dutch. It comes into blossom early. The leaves are numerous, narrow, spreading, and decay early. There are three stripes on the outer petals, which are narrow and very faint; the inner petals have three very obscure lines on the back; the inside of the flower is white. The stigmas are deep orange, spreading, equal in height to the anthers. It produces seeds, but not very abundantly.

The series of varieties of this species would be complete if it was terminated by one entirely white; this desideratum is most likely to be obtained from the seed of the kind last described.

CLASS III.

Spring Crocuses, with various-coloured Flowers (not Yellow) having the Mouths of the Flower-tubes Hairy.

In this Class there is only one species, but it possesses so many varieties, that it is more extensive in number of plants than either of the preceding Classes.

11. Crocus vernus. Common Spring Crocus.

The common Vernal Crocus has had several natural habitats assigned to it in various parts of Europe; some of them probably erroneously, from the discoverers not being

sufficiently acquainted with the distinctions which separate it from other wild species. The only natural plant which I shall notice is that which grows in the large extended meadow on the side of the River Trent, south of the town of Nottingham, where it was first described to exist by DEERING.

I originally received roots of this wild plant from Mr. GEORGE ANDERSON, who took them up on the spot; subsequently I have examined blossoms of bulbs sent up in 1824 to the garden of the Society, at my request, by Mr. JOHN PEARSON, of Chilwell, near Nottingham. Last year a fresh supply of bulbs, and much additional information on the subject were supplied by Mr. HAYTHORN, Gardener to the Lord MIDDLETON, at Wollaton Hall, near Nottingham. From these different collections which have flowered in the garden of the Society, the following descriptions of these wild plants are formed.

The blossoms are produced early before those of most of the garden varieties of the species. The leaves are not numerous at the time of flowering, they are then short, rigid, nearly upright, and do not rise above the tube of the flower; they after become spreading, but are of moderate length; they are broad, and exhibit the white lines in their middle conspicuously. The leaf sheaths are white. The flowers are of good size. The germen is cream-coloured, the tube white, slightly stained at top with lilac; the petals are narrow, lanceolate, and long; the mouth of the tube is hairy, the ground of the petals at their bases is whitish. The flowers of some are without any dark marks or spots at the base of the outer part of the petals, the whole being a uniform pale

purple, except that their tops are somewhat darker, and a little feathered, and the inner petals are slightly feathered. Others are a darker purple, and have dark purple pointed spots on the outside of the base of the petals, and are also darker at their tops; the inner petals of these are neatly feathered, and have whitish edges. The stigmas are small, equal, bifid, and are elevated above the anthers. The roots are small, flattened, covered with a coarse thin pale brown striated coat, and do not increase very much. The preceding description will apply to most of the blossoms, but very great variation occurs in them; in some the petals are broader, shorter, concave, forming obovate flowers; some flowers are very pale lilac, others dark purple, and the featherings vary much, some being more marked than others; some are even nearly white; the stigmas are also occasionally very pale yellow. I have also seen an instance where eight petals and four stigmas were produced by one flower. The figure of the Nottingham plant in English Botany, tab. 344, is good and correct, it is without the dark markings at the base of the petals.

I believe that the Nottingham meadow is the only certainly wild station of the Crocus vernus in England. Like others of our hardy bulbous plants, it will however remain and increase where it was originally a garden plant, long after every vestige of cultivation has disappeared, if the place where it was left be undisturbed. Several such neutralized habitats, if they may be so called, are known to English Botanists. I have for many years been acquainted with a spot of this description in the Park at Brookmans, in Hertfordshire, where a considerable extent, perhaps near half an acre, is enlivened with the blossoms of Crocus vernus

every Spring. Since I have known the place, the plants have extended themselves considerably, evidently increasing from seed, and in a few instances varying to white, though most of the blossoms are purple ; and generally, though with exceptions, similar. They come into flower rather later, and the flowers are also smaller than those of the Nottinghamshire wild plant; the top of the tube and base of the petals on the outer side are marked with dark purple, the petals are lanceolate, rather concave, forming a fusiform flower; the outer petals are darker at the top but not spotted, the inner petals are paler, with slight indications of feathering. The stigmas are pale orange, broad at top, and elevated above the anthers. The leaves are broad, upright, and not numerous. Several trees of considerable size and age are growing in the place where these Crocuses are to be seen; it has been under grass beyond the recollection of any person, and no record remains of the existence of a garden there; it is however within a small distance of the mansion house.

The varieties described in the following pages have been selected from a much larger collection, none but those having some merit or peculiarity have been retained, being the result of many years attention. As this species freely reproduces itself from seed, and as the seedlings are subject to much variation, the extent of a collection may be rapidly enlarged, though perhaps few individuals will be obtained which may be thought deserving of comparison with those which have been taken to form the following arrangement.

The varieties have been divided into six sections, founded on the prevailing colour, or peculiar markings, of each division. To those a seventh section has been added, consisting of those which flower so late, that they do not

produce their blossoms till the exhibition of all the others has terminated.

The bulbs of the different varieties vary in size, they are however generally small, and resemble those of the wild Nottingham plant which have been described. They all produce more or less seed.

Section I.

Purple Vernal Crocuses, having blossoms, the outer petals of which are nearly of one colour, from dark purple to pale lilac inclusive, being sometimes blotched, and without any or with very little white; the inner petals being either of a uniform colour paler than the outer, or feathered. These are arranged, beginning with the darkest, and proceeding to the palest of the Section.

1. C. vernus puniceus.
2. —— purpureus.
3. —— marginatus.
4. —— Sabini.
5. —— grandis.
6. —— obovatus.
7. —— concinnus.
8. —— Phäeton.
9. —— maculosus.
10. —— turbinatus.
11. —— clavatus.
12. —— violaceus.
13. —— dubius.
14. —— pruinosus.
15. —— fusiformis.
16. —— stylosus.
17. —— plumbeus.
18. —— inflatus.
19. —— tulipaceus.
20. —— pallens.
21. —— minutus.
22. —— pallidus.
23. —— Neapolitanus præcox.
24. —— lilacinus præcox.

1. *C. vernus puniceus.* Comes late into and remains long in flower, producing a moderate quantity of blossoms. The leaves are broad and rather spreading. The spathe is large,

swollen, and rises above the tube; the flower is obovate, of moderate size, but has a very rich appearance; the tube is very dark purple at top, ending downwards in dark lines, and upwards in very dark spots on the petals; the petals are broad, obovate, concave, the outer generally notched at their tops, dark purple on the outside, marked within at the base with white featherings; the inner petals at the back are purple with dark spots on their lower part, and are very beautifully marked within with white, and purple feathered lines, on lilac ground. The stigmas are large, orange, a little shorter than the anthers.

2. *C. vernus purpureus.* Is in flower rather early in the middle season, producing a tolerable quantity of blossoms. The leaves are broad and short. The spathe is much inflated and conspicuous; the flower stands high, is large, obovate and grand; the tube is thick, coloured from some length at the top with purple; the petals are large, obovate, generally crumpled, concave; the whole on both sides a uniform dark purple, the spots at the base being slightly distinguishable; the outer petals frequently appear blotched, as if damaged by the weather. The stigmas are large, pale orange, of the same height as the anthers.

3. *C. vernus marginatus.* Produces its blossoms not very abundantly and after the middle season. The leaves are short and broad. The spathe is swollen and rises above the tube; the flowers are large and obovate; the tube is thick, dark purple at the top; the outer petals are dark purple, with a large obscure spot, blotched a little with white, and edged with white, within rather paler; the inner petals are feathered with purple, and have their edges marked with white, within they are very beautifully and distinctly feathered with purple

on whitish ground. The stigmas are orange, nearly equal in height to the anthers.

4. *C. vernus Sabini.* (*See Plate* XI. *Fig.* 17.) Was so named by the late Mr. GEORGE ANDERSON. It flowers tolerably freely and early, but not among the first. The leaves are broad, rather long and spreading. The flowers are obovate, standing high, opening well, and when expanded are magnificent, they are larger than any Crocus with which I am acquainted; the top of the tube and bases of the petals are purple, the mark at the base of the petals being less conspicuous than in some other varieties; the petals are large, obovate, concave, the outer purple, darker at the upper part, paler below towards the spot at the base; the inner petals are pale, shorter than the outer, very prettily feathered within side, and whitish at the lower part within, and on the edges. The stigmas are of moderate size, orange, standing above the anthers.

5. *C. vernus grandis.* Flowers rather abundantly and early. The leaves are broad and strong. The flowers are large, club shaped, standing high, and grand; the tube is thick, purple at the top; the petals are long and large, obovate, sometimes appearing crumpled; the outer dark purple, blotched a little with white, the dark spots at the base large and conspicuous; the inner petals are paler, striped and feathered within at their lower parts, and feathered with white on their edges. The stigmas are orange, spreading, somewhat longer than the anthers.

6. *C. vernus obovatus.* Is not very productive of flowers, which appear rather late. This is the variety figured in the Botanical Magazine, tab. 2240, as the C. obovatus of Mr.

Haworth,* of which it is a very good and correct representation, though Dr. Sims does not view it otherwise than a variety, and very judiciously doubts the correctness of considering the length of the stigmas, and their elevation relative to that of the anthers, as a sufficient specific distinction. It was called C. vaginalis in the collection of Mr. George Anderson. The leaves are short, broad and upright. Flowers large and very handsome, perfectly obovate, the top of the blossom appearing almost truncated; the spathe rises above the tube, which is very thick and purple at the top; the petals are concave, large, very broad and obovate; the outer have a small obscure purple spot at their base; both outer and inner are a rich uniform purple, the latter being paler and shorter. The stigmas are deep saffron colour, broad at top, and situated below the anthers.

7. *C. vernus concinnus.* Is in flower late in the middle season, and its blossoms are tolerably numerous. Leaves short and upright. Flowers of moderate size, rather elongated; tube at top, deep purple; the blotches at the base of the petals are deep purple, those of the inner being divided by two whitish lines; the petals are broadish, concave and obtuse; both outer and inner petals are a uniform purple, but the former are the darkest. The stigmas are orange, small, varying in length in different flowers, some being higher, others lower than the anthers.

8. *C. vernus Phäeton.* Flowers freely and early in the middle season. The leaves are few and grow upright. The flowers are rather small; the top of the tube is purple; the three outer petals are purple, with the mark at the base

* See Horticultural Transactions, vol. 1. page 123.

darker; the petals are narrow at the top, and slightly concave; the inner petals are beautifully feathered with lilac and white, their edges neatly pencilled with white. The stigmas are small, yellow, equal to the anthers. This is the variety figured as the Crocus Neapolitanus in the Botanical Magazine, tab. 860, where it is well represented, though there seems to be no good authority for considering that name as belonging to it. It is called Phäeton by some of the Dutch gardeners.

9. *C. vernus maculosus.* The flowers are not very abundant, they come late, and remain some time. The leaves are short and broad. The flowers are large and obovate; the spathe rises to the top of the tube, which is thick, and slightly marked with purple; the petals are large, broadly obovate, and concave; the spots at the base are pale, small, feathered, and divided by two white lines; the upper parts of both inner and outer petals are blotched with purple on a lilac ground, the edges of the inner petals are marked with white. The stigmas are large, orange, and equal to the anthers.

10. *C. vernus turbinatus.* Flowers tolerably freely and early in the middle season. The leaves are short and broad. The flowers stand high, are large, very truncated at top; tube purple at top; the outer petals marked with large dark purple spots, joined with the colour of the tube, and terminated with very short feathered rays; the rest of their backs and their inner side are bright purple, paler towards the lower parts; the inner petals paler purple, and slightly feathered with white on their edges; all the petals at the bottom within side are marked with short purple lines; the spot at the base of the inner petals is paler and smaller; the petals rather broad, but short, concave, and obtuse. Stigmas dilated, much

elevated, pale orange. This variety has a great disposition to produce eight petals and four anthers; I have also seen it with ten petals, looking like a double flower.

11. *C. vernus clavatus.* Flowers tolerably abundant and early. Leaves very broad and short. It has a large tall club-shaped lilac flower; the tube long, pale purple, or lilac, with faint lines; the petals particularly wide at top, and marked at top with dark purple feathered spots, they are paler on the middle and lower parts, the spots at the base are not very conspicuous, and are divided by two white lines; the inner petals are indistinctly feathered, and are pale at the bottom. The stigmas very large, orange, and elevated above the anthers. The flowers of this are the largest of all next to the variety called Sabini.

12. *C. vernus violaceus.* Produces flowers abundantly and early. The leaves are moderately broad, rather numerous. The whole flower externally a rich lilac, with dark purple feathered spots at the base; internally at the bottom pale, with slight featherings; it is rather fusiform than obovate; the tube at top purple; the petals concave, obtuse at the top; the inner petals paler and feathered at the edges with white; the spots at the back of the outer petals are not very different from the colour of the other parts. The stigmas pale orange, not large, elevated above the anthers.

13. *C. vernus dubius.* Flowers tolerably abundantly, and remains in blossom into April. The leaves are numerous, narrow, and long. The flowers are tall, fusiform, and handsome; the tube slightly purplish at top, running downwards with fine lines, and rising upwards in undefined spots into the petals; the outer petals are long and lanceolate,

striped, or rather blotched, with lilac within and without; the inner petals shorter and paler, marked in a similar manner. The stigmas are pale orange, small, longer than the anthers. From the lateness of the period to which the blossoms remain, this might be considered as belonging to the last Section. This variety has in some collections been called Crocus Neapolitanus.

14. *C. vernus pruinosus.* Is tolerably abundant in flowers, it comes late into, and remains late in blossom. The leaves, which scarcely appear with the flower, are broad and upright. The tube is bright purple at the top, but the colour does not continue low down; the purple spots on the outer petals are finely feathered into the petal, and divided by white lines, which do not extend to the edge of the spot; the upper part of the outer petals dark and minutely feathered on the edges within, pale below, and dark at the top; the inner petals deeply and beautifully feathered over the whole surface within and without. The stigmas yellow, equal to the anthers.

15. *C. vernus fusiformis.* Flowers freely, but rather late. The leaves numerous, narrow, short at the time of flowering, and spreading afterwards. The flowers are very slender and smaller than most others; the tube much elongated, lilac at top, and running with an extended narrow pale spot into the petals, which are paler next the spot, darker lilac at the top; petals lanceolate and narrow; the inner petals shorter than the outer, a little feathered at the edges. The stigmas small, orange, above the anthers.

16. *C. vernus stylosus.* Flowers very early and abundantly. Leaves rather numerous, broad, and spreading. The flower elevated, with a long tube; the tube purple at top, running

into spots on the petals; the petals narrow and long, the outer ones concave, pale purple, and very pale on the sides of the spots at the base; the inner petals light purple, beautifully feathered and veined with white. The stigmas deeply divided, pale orange, long, and shewing themselves at the top of the flower when it is closed.

17. *C. vernus plumbeus.* (*See Plate* XI. *Fig.* 10.) This flowers not very abundantly, but early in the middle season. The leaves rather numerous, become long and grow upright. The flowers fusiform and contracted at the base; the tube is marked with purple at the top; the petals narrow, long, and rather concave; the base of the petals purple, but not in spots; the outer petals a bluish lilac, the spots at the base diluted into and mixed with the colour of the petals, and divided at bottom by white lines; the inner petals within and without feathered with white on lilac. The stigmas pale orange, small, a little longer than the anthers.

18. *C. vernus inflatus.* (*See Plate* XI. *Fig.* 13.) Flowers tolerably abundantly, early in the middle season. Leaves few, rather broad and grow long. The flowers large, much swollen out; the tube very thick, marked with purple at the top; the petals very large, obovate, concave, and forming a perfect obovate flower, they are pale at the bottom, with a dark spot more feathered than usual, having a pair of white lines in the middle separated by a narrow purple line, the inside of the petals whitish at bottom, feathered and running into the lilac colour of the upper parts. The stigmas yellow, they are situated near to the top of the flower, and stand above the anthers.

19. *C. vernus tulipaceus.* It flowers abundantly and early,

and is a singular and beautiful variety. Leaves rather numerous, short at first, spreading after. Flowers large, somewhat obovate; the spathe rising to the top of the tube; the tube thick, and pale purple; the petals broad and obtuse, concave; the inner ones like the outer, but a little paler; the whole pale lilac, externally and internally striped irregularly and curiously with dark purple in the manner of a tulip, and not in featherings, as in most other Crocuses. The stigmas pale orange, high above the anthers.

20. *C. vernus pallens.* Flowers not very abundantly, but early in the middle season. Leaves numerous, become long and grow upright. The flowers are long and fusiform; the tube particularly long, elevating the flower considerably; the top of the tube, and the spots on the lower parts of the petals bluish purple, the remainder pale, blotched with darker purple towards the top; the petals narrow, slightly concave, and long; inside of the petals pale, and white at bottom. The stigmas orange, elevated above the anthers. It was the C. purpureus pallens of Mr. GEORGE ANDERSON's Collection.

21. *C. vernus minutus.* Flowers rather abundantly, is late and continues one of the longest. Leaves numerous and become long. The top of the tube dark lilac, with oblong lilac spots at the base of the petals; the other parts of the petals pale lilac, paler next the spot; the petals are narrow, short and lanceolate; the inner petals are paler and a little feathered. Stigmas fine, small, pale yellow, equal to the anthers.

22. *C. vernus pallidus.* Flowers late in the middle season, not abundantly. The leaves are not numerous, they are

longer than the flowers in the blooming season. The flowers fusiform tapering at the bottom, and widening upwards; the tube slender, dark purple at top, running into dark purple narrow spots on the petals; the outer petals are lanceolate, long and pointed, pale lilac, palest round the spot; the inner petals very pale, and slightly feathered. The stigmas slender, orange, and above the anthers.

23. *C. vernus Neapolitanus præcox.* Produces flowers abundantly and very early. It has not much merit otherwise. The leaves are narrow, grow long and spreading. The flowers are sharp pointed and thin in texture; the top of the tube and base of the petals lilac, the spot not defined; the petals lanceolate, flat, pale lilac, somewhat stained and blotched; the inner petals paler and less stained. Stigmas small, yellow, and above the anthers.

24. *C. vernus lilacinus præcox.* Flowers freely and very early. It is the earliest variety of C. vernus in flower. The leaves are not abundant, they grow upright and become long. The blossoms are long and fusiform; the top of the tube purple; the petals pale lilac, lanceolate, the inner rather wider than the outer, narrow, upright, and flat; the base of the petals with long narrow purple spots; the petals strongly striped with darker purple markings; the inner petals paler. The stigmas straw coloured, small and much above the anthers.

Section II.

Variegated Vernal Crocuses, having blossoms, the bottoms of the petals of which are distinctly spotted with

purple, and the other parts of the petals marked with dark irregular featherings on a pale ground.

25. C. vernus pictus.
26. C. ——— fucatus.

25. *C. vernus pictus.* (*See Plate* XI. *Fig.* 15.) Flowers early in the middle season, but not very freely. The leaves few, broad, and rather spreading. The tube and bases of the petals a shining rich dark purple; the petals large, broad, and obovate, forming an obovate flower, though not a very perfect one; the outer petals at back are most beautifully marked; from the spots at the base, at even distances from each other, rise from five to seven purple lines on a whitish ground; the lines towards the middle of the petals become feathered and gradually widen till they are united in broad feathered patches of purple on the top; the backs of the inner petals are covered with large broad purple feathers on white ground, the inside of the outer petals are like the outside of the inner petals; the inside of the inner petals are beautifully feathered with purple and white. Stigmas deep yellow, very large, standing above the anthers.

26. *C. vernus fucatus.* (*See Plate* XI. *Fig.* 14.) Raised by Mr. Williams of Turnham Green. It first flowered in the year 1809, and was then named Mrs. Clarke. Flowers rather late in the middle season. The leaves are few, and grow upright. It produces but few blossoms, they are not well shaped, but are long, wide at the top, and contracted at bottom; the top of the tube and lower part of the petals are a peculiarly rich purple; the petals are long, pointed, concave, rather irregular, the whole middle part of the petals within and without is a rich mottled purple ending in featherings,

which run towards the margins, and these are white; the inner petals are like the outer, but paler; there is great variation in the size and disposition of the markings. The stigmas a little longer than the anthers, of an orange colour, broad, and much dilated.

Section III.

Spotted Vernal Crocuses, having blossoms, the outer petals of which are blotched or spotted with dark purple, and the other parts of the same marked with white; the inner petals having something of the same character.

27. C. vernus dorsalis.
28. C. ——— Unguis.
29. C. ——— Unguis major.
30. C. ——— leucorhyncus.

27. *C. vernus dorsalis.* Opens its flowers the end of March, and is in full perfection the beginning of April. Leaves short and grow upright. The flowers are tolerably abundant, very beautiful, obovate, but not large; the tube short, thick, striped at top with purple; the spathe growing above the tube; the outer petals broad, obovate and concave, marked on the base at the outside with an obscure purple feathered spot, divided in the middle by two longish broad white stripes, rising high up the petals, with a dark purple line between them; the rest of the petals purple, with a dark blotch near the top, but terminated by a paler margin, paler within, white at the base; the inner petals a little smaller and paler, feathered within and without with lilac on a paler ground. The stigmas orange, thick, short, about equal with the anthers, which are also short. The lateness of

the period of which this variety flowers would almost justify its being tranferred to the last section.

28. *C. vernus Unguis.* Flowers not very freely, but early in the middle season; the blossoms go off soon. Leaves few, broad and spreading. The flowers inclining to be obovate, and of moderate size, of a beautiful lilac, with white tips; spathe long; the tube purplish, as well as the base of the outer petals; all the petals marked at their tops with white; the inner petals are feathered within and pale without, with white tops; the part of the petals next the spot is pale, gradually darkening towards the top, and abruptly terminating in the white top. The stigmas orange, equal to the anthers.

29. *C. vernus Unguis major.* Does not produce many flowers; they open early in the middle season, and go off soon. Resembles the last, but is larger, and the colour of the whole of the petals is paler in all the parts. The stigmas deep orange, and shorter than the anthers.

30. *C. vernus leucorhyncus.* (*See Plate* 11, *Fig.* 12.) *Pheasant's Feather Crocus*, so called by Mr. WILLIAMS, of Turnham Green, who raised the variety. Shows its head very early, but proceeds slowly to opening, and is in blossom in the latter season, but not late; does not produce many flowers. Leaves not abundant, of moderate breadth, and upright. The flowers are small and short, and most conspicuous as they rise; the top of the tube is white; the petals small and concave, the inner ones shorter than the outer; the whole of the petals pale except the tops, which have a small purple spot, surmounted with a patch of pure white, occupying the whole top of the petals; the inner petals are tipped with white, but have not so much of the dark colour

below, but only a tinge of purple. The stigmas orange, and shorter than the anthers.

Section IV.

Striped Vernal Crocuses, having blossoms, in which both the inner and outer petals are regularly striped or feathered.

31. C. vernus pulchellus.
32. C. ——— lineatus.
33. C. ——— striatus.

31. *C. vernus pulchellus.* (*See Plate* 11, *Fig.* 19.) A seedling of my own raising. Flowers early in the middle season. Leaves not abundant, of a moderate breadth, being rather long, and grow upright. The flowers stand very high (the highest of any) on the tube, and are not produced in great numbers, they are fusiform; the tube very long, marked with six faint lines running into the centre of the petals; the petals lanceolate, narrow, folding in on the sides, contracted at the top, of a very delicate lilac, at the bottom paler or nearly white; the whole neatly marked at the bottom with lines of lilac, and above by pale featherings extending over the whole surface; the backs of the outer petals are more conspicuously marked than the others; the inside of all the petals lightly feathered. The stigmas orange, standing a little above the anthers.

32. *C. vernus lineatus.* Flowers early in the middle season, not plentifully. The leaves are rather spreading and narrow. Flowers middle sized; the whole of them including the tube beautifully striped and feathered with pale lilac on a paler ground; the stripings on the tube, and just above it, darkest; the petals oblong, slightly concave and long; at the bases of

the outer petals, the stripes are in three broadish lines. The anthers are a little longer than the stigmas, which are orange and not large.

33. *C. vernus striatus.* This is the kind usually sold as the *Striped Crocus*. Flowers abundantly, early, and is very beautiful. Leaves very numerous, rather narrow, short at first, and spreading afterwards. It produces a sharp pointed fusiform flower, not opening well; tube white; the petals long, lanceolate, narrow and flat, blotched at the base with small irregular purple spots and lines, those on the outer being spots, on the inner they are lines; the backs of the outer petals very faintly tinged with lilac, having one faint purplish line along the centre; the outer petals are marked within with a large lilac spot, feathered to the edges, which are white; the inner petals shorter, marked within and without with fine feathered lilac lines on a white ground, the edges being white. The stigmas small, shorter than the anthers.

Section V.

Gray Vernal Crocuses, having blossoms, with the external parts of the outer petals a dingy white or gray colour, the internal parts of the same colour and the inner petals being much feathered or striped; coloured at the top of the tube generally, but not in all cases.

34. C. vernus Glorianella.
35. C. ——— Gloriana.
36. C. ——— variegatus.
37. C. ——— propinquus.
38. C. ——— dentosus.
39. C. ——— bicolor.
40. C. ——— reticulatus.

41. C. —— griseus.
42. C. —— pectinatus.
43. C. —— incurvus.
44. C. —— lineellus.
45. C. —— obesus.

34. *C. vernus Glorianella.* Flowers rather plentifully but late. Leaves numerous, narrow, upright, and grow long. The flowers are small, fusiform, and very beautiful; the tube is a deep lilac colour which runs up into the petals in spots; the petals narrow, lanceolate, slightly concave; the outer ones with lilac spots at the base, terminated by three short sharp points; the rest of the back gray, with an obscure feathering at the top; inside in the middle is a uniform lilac spot, feathered to the edge, darker at the top; the inner petals on both sides with broad lilac featherings on a white ground; the featherings do not extend to the edges. The stigmas small, yellow, extending a little above the anthers.

35. *C. vernus Gloriana.* (*See Plate* 11, *Fig.* 18.) Flowers in moderate quantity, and early in the middle season. Leaves of moderate breadth and spreading. The flowers incline to an obovate shape; tube faintly marked with purple at the top; the petals are elongated, narrow at bottom, and widening much upwards; on the outer petals at bottom is a broad line of purple, terminating upwards in three elongated points; the rest of the back is gray, marked within with a broad feathered spot; the inner petals within and without are marked with broad purple feathered lines on white ground. The stigmas orange, longer than the anthers.

36. *C. vernus variegatus.* Does not produce many flowers, these open in the middle season, and are very fine and beautiful. Leaves rather numerous, grow long and spreading.

Flowers tall, large, and club-shaped; the tube very much elongated and purple for some length at its top; the petals large, long, irregularly concave, the outer ones marked at bottom with a bright lilac spot, terminating upwards with sharp pointed rays; the rest of the petals a dingy white or gray; the inner petals on their outsides having the greater part of the centre occupied with a broad patch of lilac, which is deeply feathered at the top and sides, the edges of the petals being a dingy white; sometimes the outer petals towards the top shew a stain of purple through from the inner part; the insides of all the petals are marked with purple, and feathered like the outsides of the inner petals, with less colour in the inner than in the outer petals. The stigmas are orange, and large, elevated above the anthers.

37. *C. vernus propinquus.* A variety of the preceding; differs in the backs of the inner petals having the lines broader, with the appearance of being blotched; in other respects similar, except that the leaves are shorter.

38. *C. vernus dentosus.* Approaches to C. vernus variegatus. Flowers not abundantly and rather late. Leaves very numerous, long, and spreading. The flowers are large, and somewhat obovate; tube purple, which colour runs into the spots on the petals; the petals broad, obtuse, concave; the outer ones marked with purple spots, the tops terminated by short points, the remainder being gray; the inside of the outer petals beautifully feathered with purple on white ground; the inner petals with fine featherings running from the spots towards the edges of the petals, but not reaching the margins, being wider at top, with the margin white; the inside of the inner petals

feathered as the inside of the outer, the bottom being white. The stigmas deep orange, not large, much shorter than the anthers.

39. *C. vernus bicolor.* Flowers tolerably freely, and in the middle season. Leaves numerous, narrow, long, and grow upright. The flowers are oblong; the petals lanceolate, narrow, and long; the top of the tube and lower parts of the petals purple; the rest of the backs of the outer petals gray, tinged and feathered at the top with very pale lilac marks; the spots at the base of the outer petals pointed with three rays; the insides of these feathered with pale lilac; the inner petals, both within and without marked with pale lilac feathered stains on white ground. The stigmas unequal, much divided, and reaching to near the top of the flower, and high above the anthers.

40. *C. vernus reticulatus.* Blossoms late, producing few flowers. Leaves few, short, and spreading. The tube purple, ending below in lines, which run into the petals in spots, and these are terminated by three feathered points; the spots on the inner petals paler; the backs of the outer petals grayish white, the insides of the outer petals, and both sides of the inner, uniformly marked by lilac feathered stripes on white ground. The stigmas pale orange, not large, standing nearly equal to the anthers.

41. *C. vernus griseus.* Flowers early in the middle season. Leaves not numerous, broad, and short. The flowers are few, short, and thick; tube purple at top; the petals broad, short, concave, and obovate; the outer ones with a broadish purple spot at their base, ending obscurely in three points, and run-

ning below into the tube; the rest gray, with faint featherings of purple; the inner petals with a large purple feather over the whole, rising from a purple spot; the inside of all with pale purple feathers on white ground. Stigmas deep orange, rather large, shorter than the anthers, which are very large.

42. *C. vernus pectinatus.* Flowers late and in good quantity. Leaves numerous, narrow, become long, and grow upright. The flowers approaching to obovate; the top of the tube, and the whole lower part of the flower white both within and without; the backs of the outer petals white, showing the internal featherings transparently through, and occasionally marked with broadish or narrow purple stripes, variously disposed; the inside of the outer petals and both sides of the inner petals marked with lilac stripes and featherings on a white ground, the lines not extending to the margin. Stigmas pale orange, large, shorter than the anthers.

43. *C. vernus incurvus.* Flowers freely and abundantly early in the second season. Leaves few and broad, grow long and spreading. The flowers well shaped; tube at top deep purple, which, running into rich purple spots on the petals, end in the outer in three lines, terminated by points; the petals large, concave, forming an obovate flower; the back of the outer petals gray, showing the marks through; in the inner petals the lines from the tube, instead of terminating in points, run to the top in conspicuous lines, feathered on the top on a white ground; the insides of all the petals are marked with purple widely feathered lines. The stigmas rise above the anthers, and are small and orange.

44. *C. vernus lineellus.* Flowers tolerably freely and early in the middle season. Leaves numerous, and grow very long

and spreading. The flowers of moderate size; the top of the tube deep purple, as well as the bottom of the petals; the spots at the bottom of the petals ending in points; petals lanceolate, upright, scarcely concave; the backs of the outer petals dullish white, obscurely feathered; their inside, as well as both sides of the inner petals, elegantly striped with pale lilac lines on white ground. Stigmas orange, very short, much below the anthers.

45. *C. vernus obesus.* Flowers freely and late in the middle season. Leaves numerous, grow long, and spread wide. Spathe reaching high up the tube; the tube of the flower thick, and stained with rich purple, which colouring is united with the purple spots of the petals; the petals are short, blunt, and concave, thin in texture, the outer larger than the inner; the bases of the petals are marked with large purple spots, which in the outer petals are terminated by points or rays; the rest of the petals being grayish white; on the backs of the inner petals the spots are terminated by lines which extend up the petals; the inside of all the petals are marked by narrow light purple lines, extending over them to nearly their tops and edges. The stigmas orange, a little shorter than the anthers.

Section VI.

White Vernal Crocuses, having blossoms with the external parts of the outer petals white (except the base, which in some is marked with purple,) the internal parts of the same, and the inner petals, being either striped with narrow stripes on white ground, or white.

46. C. vernus crassus.

47. C. ——— Andersonii.

48. C. —— parvulus.
49. C —— trilineatus.
50. C. —— obsoletus.
51. C. —— albus major.
52. C. —— albus minor.

46. *C. vernus crassus.* Flowers moderate in number and come late in the middle season. Leaves abundant, broad, grow very long and upright. The flowers large and obovate; the spathe higher than the tube; tube short, dark purple running into the petals; the outer petals white, with a short purple spot at the base terminated with points; the rest of the outer petals white, with faint lines inside; the inner petals have a large spot on the base at their outside, from which lines run up the petal, the same is less conspicuously marked on their inside; the petals broad, obtuse, of thin substance, concave. The stigmas bright orange, very large, much shorter than the anthers.

47. *C. vernus Andersonii.* (*See Plate* XI. *Fig.* 16.) The C. vernus giganteus of Mr. George Anderson. Flowers abundantly in the middle season, but not early. Leaves numerous, narrow and short. The flowers are obovate, very grand, standing well above the ground; the top of the tube purple, with white intervals; the purple running up into, and forming large pointed spots at the base of the petals; which are otherwise all white, obovate, and concave. The stigmas are elevated above the anthers, and are large and yellow.

48. *C. vernus parvulus.* Produces its flowers rather late. Leaves few, broadish, short and spreading. The flowers are fusiform, small, and not very numerous; the tube striped with lilac lines which rise into the base of the petals. The outer petals at their base marked with three lilac lines; the rest

white, within in the middle of the petals are five lilac narrow feathered lines; the inner petals have similar lilac lines at their base, and faint feathers above on the outside, within they are feathered rather more than the insides of the outer petals. The stigmas orange, longer than the anthers.

49. *C. vernus trilineatus.* Produces a tolerable number of flowers but late. Leaves rather broad, short and spreading. The flowers are of moderate size; the spathe grows high; the tube of the flower thick, marked with short purple lines, mostly, but not in all cases, united to the lines on the petals; on the bases of the three outer petals are three purple short lines parallel to each other; three similar lines are on the base of the inner petals, but these, especially the middle one, sometimes run higher up the petals; the remaining parts of the petals are pure white, except that there are occasionally three faint narrow lines on the inside of the inner petals. The stigmas pale orange, very short, much below the tops of the anthers.

50. *C. vernus obsoletus.* Blossoms moderately in the middle season. Leaves of moderate breadth, short, and grow very erect. The flowers are not of a good shape; they are perfectly white except at the base of the petals; on each of the three outer petals is a single short line of purple running into the tube; the three inner petals have at their base three purple lines, the centre of which only runs into the tube, varying however, and being in some cases broader than in others. The stigmas are orange, and very short, much below the anthers.

51. *C. vernus albus major.* (*See Plate* XI. *Fig.* 11.) The flowers are produced early in the middle season. The leaves are few, of moderate breadth, grow long and erect.

The flowers are largish, rather numerous, they do not grow high and are nearly obovate; the petals are short, very transparent, broad and obovate; the whole flower pure white, without any colour. Stigmas bright orange, not small, shorter than the anthers which are pale yellow.

52. *C. vernus albus minor.* Blossoms rather abundantly and late in the middle season. Leaves very abundant, narrow, and grow upright. The flowers are small and club shaped. The petals are pure white, free from any sort of colour, narrow and lanceolate, forming a small flower. The stigmas are orange, a little shorter than the anthers, which are very pale.

Section VII.

Late Vernal Crocuses. The only distinguishing character of this Section is the lateness of their flowering, and though the varieties at present belonging to it are all dark coloured, and would, were it not for the time when their blossoms are produced, have been classed with the Purples; yet as it is possible that seedlings may be obtained hereafter, possessing the same property of late flowering, with all the variations of colouring belonging to the other Sections, it seems best to separate them.

53. C. vernus delectus.
54. ——— Neapolitanus.
55. ——— alpinus.
56. ——— Aprilis.
57. ——— tardiflorus.

53. *C. vernus delectus.* Flowers tolerably abundantly. Opens its blossoms the end of March, when all the preceding varieties with the exception of a few only of their late flowers are quite over. It is in perfection the beginning of April. The

leaves are short and broad, growing upright. The blossoms are very beautiful, obovate, but not large; the tube is short, thick, and striped at top with purple; the outer petals are broad, obovate, and concave, marked at the base on the outside with an obscure purple feathered spot, divided in the middle by two broad white stripes running through it up the petals, with a dark purple line feathered at the top, between them; the remainder of these petals are purple, with a dark blotch near the top, but are terminated by a paler margin; within they are paler, and white at the base; the inner petals are somewhat smaller and paler, feathered within and without with lilac on a lighter ground. The stigmas are orange, thick and short, about equal with the anthers, which are yellow. This is a Crocus of much excellence, its time of flowering, its fine colour, and beautiful markings, combine to render it of great value.

54. *C. vernus Neapolitanus.* Flowers tolerably abundantly, and remains perfectly in blossom into April. The leaves are narrow, rather long and upright. The flowers are tall, fusiform, and handsome; the tube slightly purple at top, which colour runs downwards with fine lines, and rises upwards into undefined spots on the petals; the outer petals are rather long, and lanceolate, striped or rather blotched with lilac within and without; the inner petals are shorter and paler, marked in a similar manner. The stigmas are pale orange, small, rather longer than the anthers. I consider this variety to be the one to which the name of Neapolitanus properly belongs; it is probably of Italian origin.

55. *C. vernus alpinus.* A free flowering kind, opening its blossoms the end of March, and continuing perfect far into

April. Leaves few and upright. Flowers small and fusiform; the top of the tube pale purple, running into a pale undefined spot at the base of the outer petals; the remainder of these petals are pale purple, paler near the spot, and darker towards the top; the inner petals are pale and obscurely feathered, shorter than the outer. Stigmas small, pale orange, shorter than the anthers, which are yellow. This was called C. Alpinus by Mr. George Anderson, he understood that it came from Switzerland, and thought it distinct from C. vernus; I cannot however separate it.

56. *C. vernus Aprilis.* Is not in full flower till the beginning of April, and produces its blossoms very abundantly till the middle of the month. The leaves are not numerous, short, narrow and upright. The flowers are small and fusiform; the top of the tube is dark purple, running into dark purple feathered spots at the base of the petals, those on the inner petals are smaller than those on the outer; the petals are lanceolate, pointed, somewhat concave, purple within and without, palish next the spots at the base; on the tops of the inner petals are slight featherings. The stigmas are very small, orange, standing above the anthers which are yellow. Too much cannot be said in commendation of this variety; during the whole of the first part of April, it renders the garden gay with its richly coloured and numerous blossoms.

57. *C. vernus tardiflorus.* Is the last to appear, coming out in April, and is in perfection in the middle of the month. Is tolerable free in flowering. Leaves short, few and upright. Flowers short, small and fusiform, more resembling those of C. Alpinus, than those of C. Aprilis; top of the tube purple, ending below in purple lines, and above in

a dark undefined feathered spot; petals of equal length, the outer ones purple, the inner ones prettily feathered. Stigmas large, orange, much longer than the anthers which are pale yellow. This is a very fine variety, but neither so rich nor prolific in flowers as the preceding, but it has the merit of being something later in blossoming.

Postscript.

Whilst this Paper has been in the press, the two Crocuses mentioned at p. 438, as having been found growing in the Park of Sir HENRY BUNBURY in Suffolk, have been published in the *Botanical Magazine* and in the *Supplement to English Botany*, from specimens sent from the same place. The species which I have described as Crocus lagenæflorus is called in both these works (Bot. Mag. fol. 2986 and Eng. Bot. Sup. fol. 2646) Crocus aureus. I have given my reasons, at page 444, for considering the Crocus aureus of Flora Græca distinct from Crocus lagenæflorus, and I still retain this opinion. The other species, my Crocus argenteus, is called in the latter work (Eng. Bot. Sup. fol. 2645) Crocus præcox; but though C. argenteus is quoted as a synonym, no reason is assigned for the adoption of this new name. It is identified in the other work (Bot. Mag. fol. 2991) with the Crocus minimus (Red. Lil. vol. 2, tab. 81) of REDOUTÉ; this is certainly a very happy conjecture of my valued friend Dr. HOOKER, and I should be disposed to agree with him so far, as to consider C. minimus to be the form assumed by C. pusillus (to which I have stated, page 455, my C. argenteus to be nearly allied) in Corsica, the habitat of C. minimus, had not the representation of the root by REDOUTÉ been such as to make it impossible, unless an error in the figure is admitted, for the bulb is drawn without the characteristic circular division of its coat; a mistake into which the artist in English Botany has also fallen. The bulbs of C. argenteus found at Barton have that character. —The further investigation respecting these Suffolk Crocuses made in these works almost satisfies me that Sir JAMES SMITH was wrong in supposing the C. Mæsiacus (called by him C. reticulatus) to be one of the species growing in Sir HENRY BUNBURY's Park.—On the Plate of the *Supplement to English Botany* on which the C. lagenæflorus is figured, is represented a flower of a Yellow Crocus with stripes on the bases of its petals, and which I am informed was taken from a specimen received with the others; this is doubtless the plant which was mentioned to me (see page 438) as C. luteus; it may be that species, or if not, it is a distinct variety of C. aureus; if the latter, it will be new to our gardens.

LI. *On the Cultivation of Air Plants in Stoves. In a Letter to the Secretary. By Mr.* Thomas Fairbairn, *F. H. S.*

Read September 2, 1828.

Sir,

In the Summer of 1813, I flowered the Air Plant, or Aerides odoratum, very finely ; it was one complete basket of flowers, and is in the recollection of many Gentlemen who were in the habit of going to see Sir Joseph Banks, at his library in Soho Square ; the plant was kept there for some weeks. The treatment was as follows :—I put the plant when first received, into a basket with old tan and moss, and hung it up in the Pine House, where it was exposed to the summer sun and to the fire heat in winter; a tub of water was placed near it, so that I could take down and plunge the basket six or seven times a day, or as often as I passed it.

The Air Plant that I have flowered so successfully lately at Claremont is Renanthera coccinea ; it was brought from China by Captain Mitchel, in 1824. Its treatment has been nearly the same as that above described, with some variation however, which cultivators may find an improvement :—first, some old rotten roots of fern and moss were collected, and put into the bottom of a china jar, in which the plant was placed, it was then covered nearly over with the same materials, and as roots were made, they were covered with more moss; it was then suspended over the flue where the fire comes into the house, and a large water-pot, with a syringe was always

ready to give the plant a plentiful supply of water at every opportunity, by which means that part of the house was kept moist.

I should add, that the young roots in winter time ought to be well covered from strong fire heat, or they may dry up too quickly. The east end of the house is to be preferred for suspending the baskets, boxes, or pots, in which the plants are grown; the water can be applied to them there both in the morning and in the afternoon, and they can be kept more moist there than if they were on the west side. The plants may be also placed on the flues, but in all cases it is necessary to keep them damp; and care must be taken to surround them with sufficient moss to retain the moisture.

My success has been such with the above treatment as to produce six spikes of flowers on a single plant.

I am, Sir,

your most obedient humble Servant,

THOMAS FAIRBAIRN.

Claremont Gardens,
August 25, 1828.

LII. *Upon the Cultivation of the Bouvardia triphylla. In a Letter to the Secretary. By Mr.* John Mearns, *F. H. S.*

Read April 21, 1829.

Sir,

I sit down to communicate to you my method of cultivating, in a wholesale sort of way, that charming old plant, the Bouvardia triphylla. I have at this time 100 plants of it, which will blossom strong this summer in the flower garden here, 50 of which are only from roots of last year's propagation; and many of these flowered the same season, although not planted till April. This year they will become strong flowering plants towards the autumn, after the first bloom is over.

My method of treating them is as follows:—about the middle of April I collect all my Bouvardias together, from the places where they have been kept through the dormant season, some among my Orange Tubs, others in cold frames, and others under the stage of the Green House. I turn them all out of their pots, shaking the soil completely from their roots; I trim off most of the large roots, yet retain as many of the fine fibrous ones as possible; I likewise at the same time cut down all the former year's shoots, retaining only two, three, or four eyes on each, according to the strength and age of the plant. I then plant them in pots suitable to the size of the plants, taking care neither to overpot them, nor to cramp the roots by confinement. When I have got all potted, and watered to settle the earth about their roots, I place them in a cold frame, which I cover with hay and

mats at night; I keep the lights close during the night, and even in the day unless the sun is very strong upon them, till they begin to grow, when I give them portions of air, according to the day, and their advance in growth. Subsequently I leave the lights off through the day, and lastly do not put them on at night. In about a week after they have been thus exposed, I plant them finally out for the season, either in clumps by themselves, or distributed among other plants, when they are soon in fine bloom, and continue to flower till Christmas. By the autumn some of the year's shoots will have attained nearly a yard in length, and will be crowned with fine luxuriant clusters of their splendid trumpet-like flowers.

The beauty of the plants thus treated, has been the admiration of those who have long known the plant, but have only seen it managed in the usual way; under which one or two of them are kept stinted in pots, in which its flowering season soon terminates, and its blossoms are not so attractive as those of the Scarlet Trumpet Honeysuckle.

As soon as I apprehend frost, I take up the plants with balls of earth attached to the roots, disturbing the young growing fibres as little as I can help, and place them carefully in pots that will admit of a little good mellow soil under the ball and around it. When they are thus replaced in pots and watered, so as to settle the mould, those which are in luxuriant blossom I mix among my Green-house Plants, where they make a splendid appearance till January. When the plants begin to shed their leaves, and the flowers are nearly gone, I then put them out of sight, as mentioned above, until April.

I continue the treatment of them as before stated, and it may be continued for many years, for the application of fresh soil, the trimming the old roots, the great luxuriance gained by growing without confinement of their roots in congenial soil in summer, renovate the plants, which could not be done by any other means of culture.

I propagate the Bouvardia by cuttings of the roots, which I manage as follows:—I fill some large fruiting Pine pots with good fresh mellow loam, well blended with either thoroughly rotten dung, or vegetable mould; I plant my roots all over the pot, beginning in a circle round the outside, opening the soil, and planting them with my middle finger, and continue filling up one circle within another till I finish in the centre of the pot or pots, leaving no more of the roots visible above the surface than just the top. I then water and place them in a Hot-house, where the night temperature is between 60° and 70°. As soon as the shoots get to between four and five inches high, I transfer the plants singly into pots of a small size, and by degrees harden them, after they have been established; when they have made some progress, after this transplanting, I plant them out into a bed four feet wide, eight inches between the rows, and four inches in the row; where, if the soil is good, many will soon be in flower. I pot them again before frost, and treat them as I described for my older plants.

I ought to remark, that the first shoots of the Bouvardia do not grow very luxuriant, but when the first blossoms are going off, and the plants begin to feel the fresh soil with freedom to their roots, in a congenial climate, they throw up

very luxuriant shoots from the bottom, terminated with strong blossoms, in the manner of the China Roses in Autumn, and these make a splendid show.

I have the honour to be, Sir,

your most obedient humble Servant,

JOHN MEARNS.

Shobden Court, Herefordshire,
13*th April*, 1829.

LIII. *On the probable cause of the Russet in Apples. In a Letter to the Secretary. By* JOHN WILLIAMS, *Esq. C. M. H. S.*

Read October 7, 1828.

MY DEAR SIR,

I AM desirous of drawing your attention to the different appearance Apples and Pears assume in different seasons. Apples usually coated with russet, and subject to have their skins cracked, are often smooth and free from cracks in dry summers. They were much cracked and russetted in the wet years of 1816 and 1817. A great drought set in after the middle of May in the year 1818, and we had scarcely a shower till the Apples were ripe in the autumn. The fruit was then free from russet, large, but not good flavoured, and I particularly remarked the Apple called "Sam Young," which is usually much cracked and coated with russet, had lost its usual character, was of a smooth yellow colour, enlarged in size, but not good. The alternating temperature, light, shade, dryness, and moisture, which occur many times in the course of a day, when July and August are showery, are, I am inclined to think, from long continued observations on the effects of different seasons, the causes of Apples becoming bronzed with russet. Continued rain preceded and followed by a cloudy sky, does not seem to produce the same effect; but the sudden intense light which commonly suc-

ceeds a shower at the time the fruit is wet, injures the skin, occasions small cracks, which when viewed through a magnifying glass, resemble the cracked surface called the network of a melon. If the injury is greater, the surface turns nearly black in spots or patches. A further injury occasions the crack to become deeper, and enters the solid flesh of the Apple; but if this happens in an early stage of growth, the surface of the crack becomes dry and hard, and if the injury is done when the fruit is nearly ripe, it rots. These accidental injuries of the skin in the early part of the growth of the fruit, nature patches up in the way we see, but this new surface is never like the original skin, it allows the aqueous portion of the pulp of the fruit to escape more freely by evaporation, hence there is a little shrinking in the part where it happens, and the juices become richer by a kind of inspissation. Cider and Perry made from small cracked and spotted fruit, if a fine autumn succeeds a cool showery Summer, is always of better quality than after a hot Summer when the fruit is larger, and as regards appearance, better ripened. I was much inclined to make these remarks to you when I read the paper, page 63 in the Fifth Volume of the Horticultural Transactions, as I imagine the different characters Apples assume in different seasons may be owing perhaps to their being more or less russetted. At least I have in no instance, after artificial impregnation of Apple blossoms with the pollen of others, ever obtained any resemblance in form or colour to the Apple I took the pollen from, and I have on the average of the last 16 years, artificially impregnated 20 to 30 blossoms each year. I have given the pollen of the

Alexander Apple to Golden Pippin flowers and Siberian Apples, and *vice versa*, but in no instance did the Golden Pippin or Siberian fruit become enlarged, or the Alexander Apple from the reverse process become diminished in size.

I remain, my dear Sir,

yours truly,

JOHN WILLIAMS.

Pitmaston, Worcester,
24th September, 1828.

LIV. *An Account of some new, and little known Species of the Genus Ribes.* *By Mr.* David Douglas, *F. L. S.*

Read April 21, 1829.

It is well known that of *Ribes*, the genus to which the gooseberry and currant belong, many species indigenous to both Northern and Southern America, do, in their native soil, produce excellent fruit; while the same species when transported to an English climate, seldom bear any, or when they do, the flavour is either almost insipid, or in no small degree astringent. A few exceptions, however, occur.

Among the numerous species lately introduced, and chiefly natives of America, few possess greater claims on our attention as ornamental shrubs, than *R. sanguineum*, Plate XIII. This plant, in its natural state, produces abundance of fruit, but of so musky and unpleasant a flavour, that the berries continue to hang on the bushes throughout the winter, even the birds refusing to make them a part of their food. It can hardly be expected to improve materially by culture; certainly never to such a degree as may entitle it to the rank of an edible fruit; but as it possesses considerable recommendations of another kind, I have selected it, together with six others, all growing in the Horticultural Society's Garden at Chiswick, to form the subject of the following notices.

Ribes sanguineum.

J. Clark, Sculp.

1. ***R. sanguineum*** : inerme, foliis cordatis sub-quinquelobis serratis venosis suprà glabriusculis subtùs villoso-tomentosis, racemis laxis pubescentibus foliis duplò longioribus, calycibus tubulato-campanulatis: laciniis linearibus obtusis patentibus petala integerrima excedentibus, bracteis obovato-spatulatis, baccis turbinatis hirsutis.

R. sanguineum. Pursh. Fl. Am. Sep. 1, p. 164.

This forms an erect branching *bush*, exceeding six feet in height, with red smooth *branches*, the younger twigs covered with short, brown, bristly hairs, which fall away along with the thin deciduous bark of the first year. The *leaves* are heart-shaped, more than two inches long, one and a half broad, dark green above, hoary and downy beneath, on *foot-stalks* of equal length with the leaves, which are more or less pubescent and glandular, having conspicuous ciliated or slightly fringed *stipules*. *Flower-stalks* about four inches long, lax, more pubescent than the leaves. *Calyx* half an inch long, the *tube* nearly bell-shaped, short in proportion to the spreading segments, pink or crimson. *Petals* obovate, one third shorter than the *limb*, white, becoming of the same colour as the calyx after they have been some days expanded. *Stamens* of the same length as the petals. *Anthers* white. *Style* slightly cloven. *Berry* turbinate, three-eighths of an inch long, brownish black, hairy, having a tough, leathery thick skin, with numerous, small, angular *seeds*, adhering together by a small portion of limpid viscid mucus, and completely destitute of the pulpy substance peculiar to most species of this tribe.

So long ago as the year 1787, my esteemed friend Archibald Menzies, Esq. during his first voyage round the world, discovered this species near Nootka Sound, and, subsequently

on his second voyage with the celebrated Vancouver, in 1792, found it again on various points of the coast of North West America. From that period to 1814, it lay unnoticed in our Herbaria; when the above-quoted author described it, partly from specimens collected in 1805, by the enterprizing American Travellers Lewis and Clarke, during their memorable journey; and partly from specimens deposited by Mr. Menzies, in the Herbarium of the late Sir Joseph Banks, and that of the British Museum. The species indeed inhabits a great range of country, but it is always confined to the mountainous districts of the coast, never extending beyond the influence of the sea breeze, having been found from Point Bodago in 38°. to the Straits of Juan de Fuca in 49°. abundantly; and, but more sparingly, even as high as 52°. N. Latitude. It usually grows on rocky situations or on the shingly shores of streams, in partially shaded places. It is the most common of its tribe at "*Point George*," near the confluence of the River Columbia. Whether we consider the delicate tints of its blossoms which appear in March and April, the elegance of its foliage, the facility with which it is increased and cultivated, or its capability of enduring the severest of our winters without the least protection, it may be regarded as one of the finest and most interesting additions that have been made to our shrubberies for many years. If the bushes were planted in soil having a portion of lime-rubbish mixed with it, the blossoms would certainly be more profuse and probably also of a deeper tint; a circumstance which I have observed to be the case in the limestone districts of its native woods.

The Society received seeds of this plant from me in October 1826, which I forwarded across the continent of America. The bushes were planted in open borders in the spring of 1828, and last April they blossomed in great profusion, though scarcely two years old.

2. ***R. viscosissimum***: inerme, pilis viscidis tectum, foliis cordatis obtusè trilobis serratis rugosis, racemis laxis folio longioribus, calycibus tubulato-ventricosis: laciniis lanceolatis patentibus undulatis, petalis ovatis integerrimis, bracteis persistentibus lineari-spatulatis pedicello duplò longioribus, baccis turbinatis hirsutis.

R. viscosissimum. Pursh. Fl. Am. Sep. 1, p. 163.

This is a large branching *bush*, six to eight feet high, with perfectly smooth dark-red *bark;* the viscid glandular pubescence which clothes the young shoots, like the preceding, (*R. sanguineum*), disappears with the white, thin, deciduous bark in spring. The *leaves* are heartshaped, three-lobed, serrated on the edges, rugose and veiny, three and a half inches in length, two and a half in breadth, on *footstalks* of nearly equal length, every where clothed with a copious, clammy glandular pubescence, which emits, when touched, a peculiar scent, like that of old apples. The *flowerstalks* are lax, nearly double the length of the leaves, equally pubescent and glutinous. The *calyx* is tubular, short, swollen or ventricose in the middle, with lanceolate, spreading, and somewhat waved segments, of a faint yellow colour, fragrant. The *petals* are ovate, white, one third shorter than the limb of the calyx and of the same length with the stamens. *Style* slightly cloven. The *berry* is turbinate, the fourth of an inch long, hairy, dark brown or black, with a thick tough skin. Like *R. sanguineum*, the *seeds* are small, very numerous, adhering together by a small quantity of colourless slimy fluid, having

no true pulp. The flavour of the berries is musky or mawkish, and so disagreeable that two or three are sufficient to produce vomiting. No animal, as far as I know, touches it, excepting a species of *Myoxus*, which feeds on the leaves and berries in summer, and on the bark during the winter months

It is an inhabitant only of the subalpine range of the highest mountains, abounding in dry fissures of limestone rocks, flowering in May, and ripening its fruit in August. On the hills around the Kettle Falls on the Colombia River, in 48° 37′ 40″ N. Latitude, 118° W. Longitude, at an elevation of 8000 feet above the level of the sea, it forms a principal part of the brush-wood, and is equally plentiful on the western declivities of the rocky mountains, between the parallels of 46° and 52° N. Latitude.

This magnificent species ought to have a place in the gardens of the curious, were it only on account of its dissimilarity to any of the genus.

I brought seeds of this species to England in October 1827. The plants flowered last April, in the Garden of the Society, but rather weakly, being only one year old.*

3. *R. cereum*: inerme, foliis subrotundis obtusè trilobis crenatis viscidis, racemis 3-5-floris pendulis pubescentibus longitudine foliorum, calycibus tubulatis laciniis ovatis reflexis: petala subreniformia duplò excedentibus, bracteis cuneiformibus apice dentatis, baccis rubris glabris.

This *bush* is of more humble stature and slender habit than the one last mentioned, growing erect, about five or six feet high, with white smooth *bark* on the old branches. The young shoots which are curved and flexible, are covered with

* This species is now nearly lost to the Garden.

a brown viscid scentless glutinous substance, which when exposed to the sun, acquires a rough, hardened, waxy, warty appearance. The *leaves* are nearly round, bluntly three-lobed, crenate, scarcely an inch long, of a leathery texture and almost veinless, clothed on the upper surface with white and (in dry weather) hardened waxy minute granulations, quite smooth below; *footstalks* somewhat longer than the leaves. The *clusters* are dense, of the same length as the leaves, three or five-flowered, slightly pubescent, hanging in great profusion below the branches, with scarcely any partial footstalks; *bracteas* wedge-shaped, glandular and toothed at the apex. The *calyx* is tubular, imperfectly four-sided, white, pink at the base, three-fourths of an inch long, with rounded, short, reflected segments double the length of the minute somewhat kidney shaped *petals*. *Filaments*, same length as the petals; *style* slightly cloven. *Berry* spherical, small, red and glossy, thin-skinned, rarely containing more than three large seeds and a great quantity of insipid, viscid, red juice.

This species in point of beauty cannot be compared to the fragrant flowered *R. aureum*, and its varieties, nor can it vie with the gaudy inflorescence of *R. sanguineum*. It blossoms at the same season and with equal profusion, is equally hardy and as readily cultivated.

On dry exposed decayed granite rocks or schist, throughout the chain of the river Columbia from the Great Falls 45° 46′ 17″ N. Lat. to the source of that stream in the Rocky Mountains, 52° 07′ 09″ this is a common shrub, flowering in March and April, and ripening its fruit in June.

Seeds were received in October 1826, and, under the

same treatment as the former, it flowered profusely in the Society's Garden, last April.

4. ***R. petiolare*** : inerme, foliis cordato-trilobis serratis utrinque punctato-glandulosis, petiolis longissimis, racemis erectis elongatis, calycibus planiusculis: laciniis linearibus petala integerrima cuneiformia triplò excedentibus, baccis glabris.

Bush erect and branching, from four to six feet high, with white *bark*; the young branches sprinkled with yellow small glandular dots. The *leaves* are on very long *footstalks*, heart-shaped, three-or imperfectly five-lobed, coarsely serrated, smooth and glaucous on both sides, veiny, covered with minute crowded drops of a golden-colored exudation, which diffuses a powerful aromatic odour, like that of *R. nigrum*. The *flower-stalks* are erect, long, but somewhat shorter than the leaves, many flowered, white, and fragrant, with minute, deciduous *bracteæ*. *Calyx* flattish, with spreading lanceolate segments. *Petals* ovate, three times shorter than the *limb*. *Berries* spherical, black and glossy, juicy, slightly astringent, but not unpleasant.

This species, has in many respects, a considerable affinity to *R. nigrum*, particularly in its fruit: and is still more nearly related to *R. fragrans* of Pallas in its general habit, in the leaves and in the form and colour of the flower. That species is however of more humble growth, with red berries of greater size, and extremely sweet and pleasant to the taste. *R. Hudsonianum*, a new species, abounding near the banks of streams that flow into Hudson's Bay, is also akin to it, but is diminutive, with pubescent *racemes*, and villous *calyxes*.

In deposits of decayed vegetable soil, washed down by the

torrents from higher altitudes of the mountains, among coppice wood on the western base of the Rocky Mountains, from the 48° to the 52° N. Lat. this species is frequently met with, and it is equally common on similar altitudes and situations in the high mountains of North-West America.

I brought seeds of this species to England in October 1827. The bushes grow luxuriantly in the Society's Garden, but they have not flowered as yet.

5. *R. divaricatum*: ramis divaricatis setosis, aculeis 1-3 axillaribus deflexis, foliis subrotundis 3-lobis inciso-dentatis nervosis glabris, pedunculis 3-floris nutantibus, calyce campanulato: laciniis linearibus reflexis tubo duplò longioribus, stylo staminibusque exsertis, baccis glabris.

A robust *bush*, of erect habit, six or eight feet high, with divaricated *branches*, the younger ones sparingly and unequally clothed with minute, bristle-shaped *prickles*, and having one or three large, strong, deflexed prickles, under each bud. The *leaves* are rounded, three-lobed, coarsely cut, toothed, smooth and veiny, about an inch long; the *footstalks* somewhat shorter, with a few scattered hairs near their base. The clusters droop below the branches, are three or five-flowered, shorter than the leaves, slender and smooth, with rounded subamplexicaul *bracteæ*. The *calyx* is bell-shaped, yellowish-green, with linear brownish-red, reflected *segments*, which are double the length of the tube. *Petals* wedge-shaped, white, half the length of the limb. The *stamens* are exserted beyond the calyx, half an inch long. *Style* considerably longer than the stamens, semi-bifid, spreading, villous. *Berry* spherical, smooth, one third of an inch in diameter, black, pleasant to the taste.

A common bush on the banks of streams near Indian villages, on the North West Coast of America, from the 45° to the 52° N. Lat.

This species flowered last April in the Horticultural Society's Garden. It ranks systematically next the *R. triflorum* of WILLDENOW.

6. ***R. irriguum*** ; aculeis axillaribus ternis, foliis cordatis sub-5-lobis dentatis ciliatis utrinque pilosis nervosis, pedunculis 3-floris glanduloso-pilosis, calycibus campanulatis : laciniis linearibus tubum æquantibus, baccis glabris.

A tall strong species, sometimes ten feet high, branching, nearly smooth, except having three small sharp, ascending short prickles below each bud ; *bark* white. The *leaves* are deeply cordate, three or imperfectly five-lobed, coarsely toothed, pubescent on both sides and ciliated on the margins, veiny, about an inch and a half long, somewhat shorter than the footstalks. The *flowers* are bell-shaped, in clusters of three, which are shorter than the leaves, its calyx having linear segments which equal the tube in length, and oblong *petals*, half as long as the limb. The *berries* are spherical, half an inch in diameter, smooth, juicy, with a very pleasant flavour.

A constant inhabitant of moist mountain rocks, near springs and streams, flowering in May and ripening its fruit in July. On the Blue Mountains in 46° 33′ it is very common ; also on hills on the banks of Spokan River.

Of all the species which came under my observation during my journies in America this is the finest in the flavour of its berries, as well as in their size. It has not yet flowered in the Society's Garden.

7. ***R. echinatum*** : aculeis quinis axillaribus, ramis omninò reclinatis hispidulis, foliis 5-lobis glabris, racemis nutantibus multifloris folio, longioribus, pedicellis germinibusque piloso-glandulosis, calycibus campanulatis, bracteis ovatis ciliatis, baccis hirsutis.

Branches slender, reclining, rarely divided, thickly clothed with long sharp, bristly, brown prickles; these are five or seven in number, large, long, flattened, and combined under the buds. ***Leaves*** five lobed, smooth on both sides, unequally toothed, on slightly pilose petioles, which are shorter than the leaves. The *flowers* hang in a lax, slender *raceme*, nearly double the length of the leaves; the partial *footstalks* and *germen* covered with brown glandular hairs; *bracteæ* ovate, half the length of the pedicels. *Calyx* bell-shaped, with rounded, spreading and somewhat reflected segments, brownish-yellow, with a dark rim, scarcely longer than the rounded *petals*. *Berries* black, hairy, small, of a pleasant taste.

This species in several respects is nearly related to *R. lacustre*. The depressed habit, the much more copious clothing of longer and stronger *prickles*, the less divided and perfectly smooth *leaves*, the black-rimmed *calyx* and black *fruit*, render it truly distinct. I have not seen *R. armatum* of the Linnean Herbarium, but I suspect that species to be still more nearly akin to the one now noticed.

It is a common trailing shrub, on dry shelving rocky places on the mountains, at the Grand Rapids on the Columbia, and on the mountains of Northern California, never frequenting edges of rills or swampy ground in shady woods among Carices as *R. lacustre* does. This species flowered for the first time last April, in the Society's Garden.

Several undescribed species, from the same country as those above noticed, are in a growing state in the Society's Garden, but as no native dried specimens of them exist in this country, they cannot for the present be here noticed. Many other important additions of the genus *Ribes* yet remain to be introduced to our gardens from America, among which two species of unrivalled beauty adorn the untrodden wilds of Northern California, which we hope, ere many years, to see as common in the gardens of England as *R. sanguineum* now is; and although as fruits they are precisely alike, being peculiarly disagreeable, the splendour of their blossoms and varied foliage may procure for them a distinguished place in any garden.

LV. *History and Description of the Species of Camellia and Thea; and of the Varieties of the Camellia Japonica that have been imported from China.* By Mr. William Beattie Booth, *A. L. S. Garden Clerk.*

Read August 18, and September 1, 1829.

Among the various plants which have been introduced into this country, there are few perhaps more interesting or more highly ornamental than those belonging to the two genera of which I have now the honour of presenting an account, to the Horticultural Society. With the exception of the Camellia Kissi, which is a native of Nipal, the whole are indigenous to China and the Islands of Japan, where they are held in great estimation, and where their culture is regarded as an object of the utmost importance, particularly that of Thea, the leaves of which after undergoing a certain process, are the well known Tea, which constitutes one of the chief articles of our commerce with the East, and the source from which a considerable part of our national revenue is derived. These plants, therefore, cannot but be considered as highly deserving our attention; although they are by no means to be compared with the beautiful varieties of the Camellia Japonica, which are universally admired, and which form during the winter, and early spring months, the most attractive ornament of the Greenhouse and Conservatory.

Before I proceed to the description of the species, I may

briefly notice the great diversity of opinion that has existed among Botanical writers respecting the two genera under consideration. By some the *Theas* have been referred to *Camellia*, while others regard them as forming a genus closely allied to, but differing from Camellia in several points, of sufficient importance, to justify their being separated. Linnæus not only considered them as two distinct genera, but as belonging to different classes, under which they will be found arranged in the first and second editions of his Species Plantarum; the *Theas* in Polyandria Monogynia, and the *Camellias* in Monadelphia Polyandria. In the Prælectiones in Ordines Naturales, they are brought together, and form part of the natural order Columniferæ; and it has been subsequently remarked by Sir James Edward Smith, in Rees's Cyclopedia (Article Thea) that they ought to stand next to one another in the artificial, as well as in the natural system.

Willdenow followed the arrangement of Linnæus, which was also adopted in the first and second editions of the Hortus Kewensis, and more recently by Professor Sprengel, in his Systema Vegetabilium. Mr. Ker and Dr. Sims have recorded their opinion in the Botanical Magazine, fol. 998, that the two genera ought to be united, or if they are to be kept distinct, that they should be placed in the same class. This also appears to be the opinion of Mr. Lindley, who has had the best opportunities of examining the genera, and who doubts the existence of any decisive limits by which *Camellia* is to be distinguished from *Thea*. He has, however, in the Botanical Register, fol. 1078, given brief characters of the species, which he considers strictly referable to

Camellia, namely, *C. Japonica*, *C. reticulata*, and the plant usually known in the gardens as the *Double Purple Sasanqua*, which he has named *C. Maliflora*. The other species with small flowers resembling those of *Thea* he would add to that genus; but this arrangement is objectionable, because although the plants possess many of the characters common to *Thea*, they will be found on examination to want those which are most essential in the distinguishing of that genus from Camellia.

The genus Camellia is stated by Sir JAMES EDWARD SMITH, in REES's Cyclopædia, to have been named in honour of GEORGE JOSEPH KAMEL, a Jesuit, whose name has been latinized into Camellus. He is author of Syllabus Stirpium in insula Luzone Philippinarum, annexed to the third volume of RAY's History. The characters by which the genus is distinguished are as follow.

Essential Character. *Flowers* axillary sessile. *Calyx* inferior, of 7,8 or more deciduous imbricated scales, the inner ones the largest. *Corolla* of 5 petals. *Styles* united nearly their whole length. *Capsule* furrowed, having as many cells as furrows, and one or two seeds in each.

Of this genus six distinct species are all that have as yet been introduced. I shall describe them in the following manner, viz. 1. *C. Sasanqua.* 2. *C. oleifera.* 3. *C. Kissi.* 4. *C. Maliflora.* 5. *C. reticulata.* 6. *C. Japonica.*

I. CAMELLIA SASANQUA.

Lady Banks's Camellia.

C. Sasanqua; ramis virgatis capsulâque villosis, foliis junioribus ellipticolanceolatis serratis, petalis obovatis vel obcordatis. KER, *in Bot. Register*, *p.* 12.

This plant is recorded in the last edition of the Hortus

Kewensis to have been introduced in 1811, by the Honourable Court of Directors of the East India Company, in the Cuffnells, Captain WELBANK. Its specific name (*Sasanqua*) is that by which it is known in Japan, where, as well as in China, it is very extensively cultivated.

It is of a loose straggling habit, but if the principal stem be supported when young, it will attain the height of six or eight feet. The branches are mostly pendulous, round, and twiggy, of a deep brown colour, deciduously villous and weak. The leaves are elliptic-lanceolate, thick, smooth, and flat, upwards of two inches long and one inch broad, with small roundish serratures; they are of a dark shining green, and have a prominent pale green villous midrib. The footstalks are about a quarter of an inch long, slightly villous, and channelled above, rounded beneath, nearly smooth, and of a pale green colour. The flower buds are sometimes produced singly from the axils of the leaves, but generally they are nearly terminal, solitary and sessile. They vary in size, and are comparatively smaller than those of C. Oleifera or C. Maliflora, of a roundish oval form, covered with numerous roundish concave imbricated pale green silky scales. The flowers which are white, open in November and December, and are each about one inch and a half or two inches in diameter, very much resembling those of the *Tea Tree*. They are pretty freely produced, and are composed of from five to ten, or even more, oval, concave, sometimes obcordate, slightly incurved petals, ranged in one or two rows, according as the flower happens to be single or semi-double. In the former case the petals are nearly half an inch in breadth, and expand almost flat; but in the latter they are a little twisted, and seldom exceed a quarter of an inch in breadth at their extremity. The filaments are filiform, rather shorter than the petals, generally spreading, though sometimes they rise in a close cylindrical sort of cup, and surround the styles, which are three in number, united as in the other species, and of a pale greenish yellow colour, with simple stigmas. The anthers are large, two-lobed, deep yellow.

In the Botanical Register, vol. I. p. 12, where an excellent figure is given of it, this is supposed to be the *Thea oleosa* of LOUREIRO (*Flora Cochinch.* p. 414) but from that author's description, it is not possible to determine the point satisfactorily; his account coincides in many respects with Camellia Sasanqua, and he also states that the *Thea oleosa* is called by the Chinese *Chè-deâu*.

Sir GEORGE STAUNTON, in his account of Lord MACARTNEY's Embassy, vol. ii. p. 467, has given a good figure of the

C. Sasanqua, and thus speaks of it: "A plant very like the *Tea* flourished on the sides and very tops of mountains. The Chinese call this plant *Cha-whaw*, or flower of *Tea*, on account of the resemblance of one to the other, and because the petals are sometimes mixed among the Teas in order to increase their fragrance." This plant, he further adds, is the Camellia Sasanqua of the Botanists. From the similarity in the sound of the Chinese name given to it by Sir GEORGE STAUNTON, and by LOUREIRO, it is perhaps not too much to suppose that they are both intended to apply to the same plant.

THUNBERG's figure represents it with only five petals (THUNB. *Flora Japon.* t. xxx. p. 273,) and in his description he says, "Corolla of 5 petals, rarely 6 or 7;" but the flowers that are produced upon the plants in this country have always more than 5 petals, indeed they may be said to be semi-double. This however is probably owing to cultivation, as in every other respect, except that I have just noticed, his description agrees with this plant. Other figures have been published of it in CURTIS's Monograph, fol. 1, and in LODDIGES's Botanical Cabinet, t. 1275.

I may here mention, that among the Chinese drawings in the collection of the Society, there is a representation of this Camellia with the flowers perfectly double, like those of the *White Rosa Banksia*. In 1823, a plant of this variety was imported for the Society by Captain DRUMMOND, which produced its flowers in the garden at Chiswick, in December, 1826. A figure and description of it will be found in the Botanical Register, folio 1091. As it differs in no respect from the plant I have here described, excepting in the flowers

having a greater number of petals, it is unnecessary for me to make a separate article of its description.

II. Camellia oleifera.

Oil-Seed Camellia.

C. oleifera; foliis ellipticis utrinque acutis argutè serratis subtus subaveniis, petalis bilobis, sepalis deciduis. *Lindley, in Botanical Register*, fol. 492.

This species has been overlooked by M. Decandolle in his Prodromus. It is the Oil-seed Tree of the Chinese, who cultivate it, according to Dr. Abel, in large plantations, for the sake of the excellent oil which they obtain from it in abundance by a very easy process, and use for various domestic purposes. It is called by them *Tcha-Yeoa*, which may be interpreted the "*Oil-bearing Tea Plant*;" a very expressive name, as the plant in appearance closely resembles the Tea. This author has given a good figure of it in the Narrative of his Journey in China, p. 174, App. 363, and states that it naturally grows in a red sort of soil, and will thrive where scarcely any other plants will succeed. It was sometimes found by him of the magnitude of a moderately sized Cherry-tree, and almost always that of a large shrub, from six to eight feet in height, and bearing a profusion of single white blossoms. This circumstance gave an interesting and novel character to the places which it covered. They often looked in the distance as if lightly covered with snow; but, on a nearer approach, exhibited one immense garden. It is said to have been first introduced by Lord Macartney's Embassy, but was afterwards lost until 1820, when Captain Nesbitt, of the Honourable East India Company's service, imported plants of it in the ship Essex, for the Horticultural Society, by whom it has been largely distributed.

It has some distant resemblance to the Camellia Sasanqua, but is readily distinguished from that species, being of a much more robust habit, and larger in every respect.

The branches are round, somewhat pendulous, of a dark brown colour and when in a young state densely clothed with pubescence. The leaves are thick, smooth, veiny and flat, about four inches long, and two inches broad, elliptic, tapering to both ends, but sharpest at the point, with moderately large sharp serratures, which become blunt and indistinct towards the base of the leaf. They are of a dull dark green above, and of a pale shining green beneath, covered with numerous small dots. The midrib is slightly villous on the upper side, and of a pale green colour, together with the footstalks, which are short, channelled above, and very pubescent. The flower buds are larger than those of the C. Sasanqua, nearly oval, and covered with upwards of 7 roundish concave pubescent pale yellowish-green scales, which become brown before they drop. The flowers usually open in November, and are not very conspicuous in comparison with those of C. Japonica. They measure, when fully expanded, rather more than 2 inches in diameter, and are composed of 5, sometimes 6, or even a greater number of roundish-oblong white petals, slightly tinged with pale yellow at their base. On first opening the flowers are cupped, but afterwards the petals spread almost flat, and ultimately become much twisted and recurved; each of them is thick and fleshy at the base, from which they gradually enlarge, and become thinner towards the extremity, which is about half an inch in breadth, in some flowers deeply divided, and in others only partially so. The stamina are short and numerous, and rise in a close cylindrical cup round the styles, which are pale green, usually 3 in number, united almost their whole length, but divided at the top, and a little recurved. The anthers are large, and of a deep yellow colour. The fruit has not yet been known to come to maturity in this country.

Besides the figures in the Bot. Register, and in ABEL's Journey in China, above-mentioned, another will be found in LODDIGES's Botanical Cabinet, t. 1065. It is very easily increased by grafting on the single red Camellia; when in a growing state the plants require a plentiful supply of water.

III. CAMELLIA KISSI. *Wallich.*

Nipal Camellia.

C. Kissi; foliis ovato-oblongis attenuato-acuminatis acutè serrulatis basi integerrimis, petiolis ramulisque novellis villosulis, floribus axillaribus terminalibusque subternis, stylo brevissimo, stigmatibus elongatis, capsulis trivalvibus trispermis glabris. *Wallich, in Asiatic Researches,* vol. xiii. page 428.

This plant is but little known in our gardens, having only

been introduced a few years since, and as far as I have been able to learn, has not yet produced its flowers in this country. I am therefore unable to give a complete description of it. The plants in the collection of the Society were presented by Mr. SAMUEL BROOKES, of the Ball's Pond Nursery, and Messrs. LODDIGES, of Hackney; by the former it was introduced in 1823. In growth it is erect and branching.

The shoots are round, smooth, and slightly villous, when young of a pale brown colour. The leaves are ovate-oblong, alternate, smooth, thin, and flat, usually about 3 inches long, and 1½ inch broad, with numerous small sharp serratures, and a narrow sharp point. On the upper side they are of a dark shining green, with a small villous midrib, beneath they are of a pale green, with the midrib strong and prominent, and nearly smooth. The footstalks are short and villous, of a brownish green colour, and slightly hollowed on the upper side.

In the account by Dr. WALLICH above referred to, it is stated to have been discovered by the Honourable Mr. GARDNER, on the mountains of Sheopore and Chandra-Ghiri, which form the boundaries of the valley of Katmandu on the north and south, and have been noticed in KIRKPATRICK's account of Nipal. In that country it grows to the size of a small tree, throwing out numerous leafy branches, producing abundance of small fragrant white blossoms during the rainy season, that is from July to October, and succeeded by ripe fruit, which ripen in the course of three months; from the seed the Nipalese extract an oil by pressure, which is much valued by them as a medicine.

IV. CAMELLIA MALIFLORA. *Lindley.*

Apple-blossomed Camellia.

C. Maliflora; foliis obovatis acuminatis nitidis convexis, ramulis petiolisque pubescentibus, ovario glabro. *Lindley.*

This plant, although figured and described as being a variety of Camellia Sasanqua, is unquestionably very distinct

from that species. In growth it is erect and slender, and forms a compact bushy shrub, which in the spring months is covered with a multitude of delicate purplish-red flowers.

The branches are round, twiggy, erect, densely clothed with pubescence, and of a dark brown colour. The leaves are obovate, seldom more than 2 inches long, and one inch broad, much pointed and recurved, with numerous small sharp serratures; they are of thin substance compared with either those of Camellia Sasanqua, or Japonica; to the latter perhaps they have the nearest resemblance, and like them are of a dark shining green, but they have a pale coloured villous midrib, and short, round villous footstalks. The flower-buds are oval, and blunt at the point, with comparatively large roundish-cordate, pubescent, brownish-green scales. The flowers vary from 1½ inch to 2 inches in diameter, are remarkably handsome, being very regular in their formation, and of a pale purplish red colour. The outer petals expand quite flat, some of them indeed are often reflexed, but so arranged as to give a nice even circumference to the whole flower; they are each about three-quarters of an inch broad, a little divided at their extremity, otherwise nearly round, and of a darker colour than the other petals, which are very pale, excepting at their base, where they have the same purplish tinge as the outer petals. Those in the very centre of the flower are narrow, and rise upright, a good deal resembling stamens, from being yellowish at the tip; they are short, numerous, and irregularly shaped, often undulated and deeply divided, but of nearly an equal height, and disposed in such a manner as to give to the flower the appearance of a small purplish coloured Rose. In some flowers, where the petals are not very numerous in the centre, a few parcels of imperfect stamina may be observed, but in general they are all transformed into small narrow petals.

It was first brought to this country, in 1816, by Captain RICHARD RAWES, who presented the original plant to his relation, THOMAS CAREY PALMER, Esq. of Bromley, in Kent, in whose choice collection it flowered in 1818, and was afterwards published in the Botanical Magazine, t. 2080, and Bot. Reg. t. 549, as a variety of C. Sasanqua; hence it has been cultivated, and is usually known by the name of the *Sasanqua rosea*, or *Palmer's Double Sasanqua Camellia*; but from that species it has been separated by Mr. LINDLEY, in the Botanical Register, f. 1078, who has applied to it the name here adopted.

The plants of it in the Society's collection were received originally from Mr. LEE, of the Hammersmith Nursery.

V. Camellia reticulata. *Lindley.*

Captain Rawes's *Camellia.*

C. reticulata; foliis oblongis acuminatis serrulatis reticulatis planis, ramulis petiolisque glabris, ovario sericeo. *Lindley.*

The merit of first introducing this fine species is due to Captain Richard Rawes, who brought home a plant of it in 1820, for his friend Thomas Carey Palmer, Esq. along with another great ornament of our gardens, the Primula sinensis.

It is of a strong robust habit, and very distinct from any of the other species of Camellia. The branches are round, smooth, and erect, sparingly furnished with thick flat strongly reticulated dull green leaves, usually 3½ inches long, and 1½ inch broad, with a strong pale green midrib, and numerous small sharp serratures. The footstalks are about a quarter of an inch long, brownish green, and a little channelled on the upper side. The flower buds are very large, of an oval form, somewhat pointed, covered with 6 or more proportionably large, roundish, very pubescent, pale green scales, the inner ones of them coloured at their edges like the petals. The flowers are semi-double, particularly handsome, and measure when fully expanded no less than 5½ inches in diameter. They are of a clear purplish red colour, and at first sight have much the appearance of the flowers of the *Pæonia Moutan rosea*, but the petals are not so numerous, being usually from 17 to 20 in number, much undulated, irregularly and loosely arranged; each of them is 2½ inches long, and rather more than an inch broad at the extremity, sometimes divided, but generally entire, and strongly marked with dark coloured veins. In the centre of the flower there are often a few petals very different in form, and rather paler than the others, which rise upright, and divide the stamina into separate parcels; they are for the most part narrow, deeply cut, and not unfrequently a little striped at the base and twisted. The stamina are about half the length of the petals, ranged in several rows, the inner ones rather separate from the others. Styles united, excepting at the point, often four, but most commonly three in number, and about the same length as the stamina. Ovary roundish, silky, 4 celled, with several distichous ovules.

In the Botanical Register, t. 1078, an excellent figure will be found of it, made from one of the plants imported for the Society in 1824, by their Collector, Mr. John Damper Parks. Another is published in the Botanical Magazine, t. 2784, from the plant brought home by Captain Rawes, which I saw in flower for the first time in the spring of 1826, and which I had an opportunity of then describing,

with the permission of Mr. PALMER. It is by far the most splendid of the genus that has yet been introduced, but unfortunately is one of the most difficult to propagate. The best way is by inarching on the single red Camellia; for although it will succeed by being budded or grafted in the usual manner, yet the plants that are obtained by these means are long in making any progress compared with those obtained by inarching. As it is impatient of heat, and begins to grow much earlier than the other Camellias, there is every reason to suppose that when it shall become so plentiful as to admit of a trial being made, it will be found sufficiently hardy to succeed in this climate, and at no distant period perhaps may ornament our Shrubberies.

VI. CAMELLIA JAPONICA.

Single Red Camellia.

C. Japonica; foliis ovatis acuminatis serratis nitidis convexis, ramulis petiolisque glabris. *Lindley.*

The Single Red Camellia is stated in the Hortus Kewensis, to have been cultivated before 1739, by ROBERT JAMES, Lord PETRE, and is the first of the genus that was introduced into this country. Although it was figured and described by PETIVER, in his Gazophylacium, in 1702, under the name of Thea Chinensis, and by KÆMPFER, in 1712, under that of Trubaki; yet it would appear to have been rare in our gardens in the time of MILLER, as it is not noticed in the eighth edition of his Dictionary, published in 1768. For many years it was very scarce, and as it bore a high price, was generally treated as a stove plant; but when it became more

plentiful, it was found to succeed equally well in a much lower temperature, and is now considered sufficiently hardy to endure the common winters of this climate with only a slight protection in very severe weather, as is the case with many other plants which have been introduced from the same interesting country. It is of free growth, and, in China, is said to attain the height of one of our Cherry-trees.

The stem is erect and branching, of a pale brown colour. The branches are round, clothed with numerous alternate thick ovate-acuminate dark shining green leaves, each about three inches long and two inches broad, tapering towards the base and point, and having their edges sharply serrated and waved. The midrib is strong and prominent on both sides of the leaf, but is most conspicuous on the lower side, which is somewhat veiny, and of a pale shining green, covered with numerous small dots. The footstalks are about half an inch long, quite smooth, and slightly channelled on the upper side; otherwise they are round, and of the same yellowish green colour as the midrib. Flower-bud oval, and much pointed, covered with seven or eight roundish-cordate pale green pubescent scales, which generally become brown, and drop when the flower is fully expanded. The flowers are freely produced, and open in the winter and early spring months, with those of the Double Camellias. They are from one and a half to two inches in expansion, and are composed of five, sometimes seven, roundish or roundish-cordate petals, each of which is about an inch in diameter, imbricated and connected together at the base, but opening so as to have an upright bell-shaped appearance. They are of a bright rose or red colour, and veined with darker coloured lines. In the centre of the flower rise the stamina, which are filiform, thick and fleshy at their base, and united to the petals as well as to one another, thereby forming a kind of cylindrical cup, of a yellowish white colour. The anthers are large, and of a deep yellow. The styles are generally three, closely connected together, excepting at the point, which is of a greenish colour; they are about the same length as the stamina. The seeds frequently come to maturity, and are contained in a woody pear-shaped capsule, slightly furrowed, having as many divisions as there are styles or furrows, with one or two perfect seeds in each, and several small imperfect ones; the former resemble a small brown nut, but are somewhat angular, and indented on the side next to the axis.

Good figures have been given of this species in the Botanical Magazine, t. 42; in Schneevooght's Icones, 7; and in Curtis's Monograph, f. 1. It is a much more common plant than any of the preceding, being readily increased by cuttings, on which account it is of great value to the cultivator,

as it affords an excellent stock whereon to inarch or graft the double varieties.

In addition to the six species I have thus described, three others have been published as belonging to Camellia. The first of these is the *C. axillaris* of Dr. SIMS, of which good figures will be found in the Botanical Magazine, t. 2047, Botanical Register, t. 349, and in LODDIGES's Botanical Cabinet, t. 675, under the above name, by which it is generally known in gardens; but it has subsequently been ascertained not to be a Camellia, but to belong to a different genus, and perhaps natural order. In the Systema Vegetabilium of SPRENGEL, vol. iii. 126, it is described as *Gordonia anomala*, and in SWEET's Hortus Britannicus it is named *Polyspora axillaris*.

The second species is the *Camellia drupifera* of LOUREIRO, (Flor. Cochin. vol. ii. 499) which is questioned by M. DECANDOLLE, although he has inserted it in his Prodromus, page 529. By SPRENGEL it is described under the name of *Mesua bracteata*. I have not seen any specimens of this plant, but judging from the description of LOUREIRO, it is a very doubtful species, and certainly distinct from Camellia.

The third is the *Camellia Euryoides* of Mr. LINDLEY, which I have already alluded to, and which will be described under Thea.

Varieties of the Camellia Japonica which have been imported from China.

Of these very ornamental plants the Society has formed an extensive collection, such as I may safely say is not surpassed at the present time by any other in the kingdom. Inmaking

this statement, however, it is proper to mention, that for the greater part of this fine collection the Society is indebted to the liberality of several of its members, who have devoted much of their time and attention to the cultivation of Camellias, and who obligingly presented plants of such varieties as they possessed; some that could not otherwise be obtained were purchased; and the remainder is the result of importations made at different times from China of plants that were procured through the friendly agency of JOHN REEVES, Esq.

Forty years ago none of the Double Camellias had been seen in a living state in this country, although a few of them were noticed by KÆMPFER in his Amœnitates Exoticæ, published in 1712. The Double White and Double Striped varieties were the first that were introduced, having been brought from China in 1792 by Captain CONNOR, of the Carnatic East Indiaman, for JOHN SLATER, Esq. of the India House. Two years afterwards the Double Red was imported by Sir ROBERT PRESTON, Bart. of Valleyfield, who then lived at Woodford in Essex. From that period no additions were made until 1806, when the variety known as the Buff, or Lady HUME's Blush, was imported for Sir ABRAHAM HUME, Bart. and the Waratah, or Anemone-flowered, for the Royal Garden, Kew.

In 1808, the Myrtle-leaved Red, and Middlemist's Red, were added by importation to the Kew collection; and the Semi-double Red to that of the Hon. CHARLES GREVILLE, at Paddington. These, with the Red Pæony-flowered, and the Pompone, or Kew Blush, which are supposed to have been introduced about the year 1810, the former for CHARLES

H. TURNER, Esq. and the latter for the Kew collection, are the whole enumerated in the last edition of the Hortus Kewensis, published in 1812. At that time the Camellias began to excite the attention of every cultivator, and new varieties were eagerly sought after. The White Pœony-flowered, or as it has sometimes been called, the White Waratah, and atro-rubens, or LODDIGES's Red, were the next that came into notice. The former is believed to have been among those imported for Kew in 1810; and the original plant of the latter is stated by Messrs. LODDIGES, in their Botanical Cabinet, p. 170, to have been introduced by themselves in 1809.

In 1816, the Fringed White made its appearance at the Nursery of Messrs. COLVIL, in the King's Road, and the Various-flowered in the Royal Garden, Kew, and in the garden of CHARLES H. TURNER, Esq. at Rooksnest. Another very fine variety was imported for this gentleman by Captain WELBANK, and also by Captain RAWES, for THOMAS C. PALMER, Esq. of Bromley. It flowered first in the garden of Mr. TURNER, and was named WELBANK's White, in compliment to the gentleman by whom it was introduced.

In 1820 the Blush Pæony-flowered was imported for the Horticultural Society; involuta for Lady FARNBOROUGH, and the variety known as "KENT's *Hexangular*," by Captain RAWES. In 1821, the Society, by means of Captain THOMAS LE BLANC, imported a variety which has been named LE BLANC's Red Camellia; and in 1824, a plant of RAWES's Striped Waratah was added to the collection of THOMAS CAREY PALMER, Esq. by his relation, Captain RAWES; several more varieties were brought home in the same year by

the Society's collector, Mr. JOHN DAMPER PARKS, three of which have proved to be different from any that were previously in the country, they are the Crimson Shell-flowered, PARK's Rose-striped, and SABINE's White; the latter only flowered in the garden this spring (1829). It is very distinct from any of the other varieties, with white flowers, and is named in honour of JOSEPH SABINE, Esq. to whom I am particularly indebted for having in the most liberal manner allowed me the use of the manuscripts which he had prepared upon this fine tribe of plants, with the intention of laying an account of them before the Society himself. These it is almost superfluous to say, were of the greatest assistance to me, and I am happy in having this opportunity of acknowledging the obligation.

To these 23 varieties may be added two more, which have partly been ascertained to be distinct, namely, the *Semi-double White*, and *Rose-coloured Waratah*. The former was purchased at a garden on the Continent in 1822? by THOMAS CAREY PALMER, Esq. who saw it in flower, and who presented a plant of it to the Society in 1827. In habit it has much of the appearance of the Pompone and Pæony-flowered varieties. I have however not seen its flower, nor am I aware of any having been produced in this country.

The *Rose-coloured Waratah* is one of those imported for the Society by Mr. J. D. PARKS, in 1824. It flowered in the spring of 1827, but not so perfectly as to admit of description; for the present therefore it must be considered a doubtful variety.

1. CAMELLIA JAPONICA ALBA PLENA.

Double White Camellia.

The Double White, or as it has been sometimes called, the "Bourbon Camellia," is one of the first that was brought to this country, and although later importations have greatly increased the number of varieties, still there is none of them which surpasses the present one in the beauty and the regular formation of its flowers. The plant is of a peculiar habit, and not very vigorous in growth, occasioned by its being such an abundant flowering kind compared to many of the others. It usually comes into blossom early in the season, and continues a long time in perfection.

The leaves are about 4 inches long, and rather more than 2 inches broad, slightly convex, and undulated with numerous small sharp serratures, and a long narrow point; of a pale shining green colour, and strongly reticulated, and giving to the plant an unhealthy appearance. Petioles about half an inch long, rounded on the lower side, and slightly flattened above, considerably paler in colour than the leaves. Flower-buds often in clusters at the extremity of the shoots; at first somewhat pointed, gradually becoming oval until at last, when the flower is about opening, they are almost round. The scales are of a pale green colour, tinged with brown at the edges, and slightly pubescent. The Flowers are from 3 to 4 inches in diameter, extremely regular in their appearance, the petals being disposed in circles from the circumference to the centre, and lying particularly flat and even one above another. They are of a pure white colour, excepting a few of the centre petals, which frequently have a very delicate yellowish tinge at their base. Each of the exterior petals is about an inch broad, roundish and reflexed, gradually diminishing in size the nearer it approaches the centre of the flower, where it becomes small, erect, and pointed, and in some flowers has the edges very finely cut or ciliated; when not numerous the centre is pitted or hollowed, in which a few imperfect stamina may sometimes be observed, but generally the whole are transformed into petals. The flowers of this variety are at all times the most regularly formed of any of the Camellias; many of them have the petals slightly involute on first opening, but afterwards they become quite flat.

It was first imported in 1792, by Captain CONNOR, of the Carnatic East Indiaman, for the late JOHN SLATER, Esq. of

the India House, and is one of the kinds which is now most generally cultivated.

Figures have been published in the Botanist's Repository, p. 25, in Loddiges's Botanical Cabinet, p. 269, and in Curtis's Monograph, pl. 2. In the latter work, p. 8, a variety with small flowers, is stated to have been introduced in 1816, by Mr. Lee, of Hammersmith, but it has since been ascertained not to be different from the one above described. A plant was brought home for the Society in 1824, by Mr. John Damper Parks, which on its flowering in the spring of 1826, I was inclined to consider perfectly distinct; the flowers being much larger, with the centre considerably elevated, and the outer petals reflexed so as almost to meet one another. The same individual however produced flowers in 1827 and 1828, that differed in no respect from those of the Common White.

Among the Chinese Drawings in the Library of the Society, there is a tolerably accurate representation of this Camellia, but the leaves are rather small, and have not the veiny appearance which is peculiar to this variety.

For the plants of it in the garden the Society are indebted to the liberality of W. Cattley, Esq. and Messrs. Loddiges.

2. Camellia Japonica fimbriata.

Fringed White Camellia.

The habit, growth, and general character of this variety, coincides almost in every respect with that of the preceding. The principal difference is in the flower, the petals of which have their edges ciliated or fringed, a peculiarity not at all common to any other variety I am acquainted with, unless it

is PARKS's Rose-striped Camellia, which will be hereafter noticed.

It was imported about the year 1816, but by whom I have not been able to ascertain. Mr. COLVIL, of the King's Road Nursery has the merit of being the first who brought it into notice. A figure of it is published in LODDIGES's Botanical Cabinet, t. 1103. The plant in the Society's collection was received from Mr. COLVIL in 1820.

3. CAMELLIA JAPONICA VARIEGATA.

Double Striped Camellia.

This variety which is always the first that comes into blossom, was brought from China along with the preceding in 1792. It is of a robust habit, with comparatively strong dark coloured spreading branches.

The leaves are 3½ inches long and 2 inches broad, roundish-ovate, somewhat convex, with moderately large serratures, and a bluntish recurved point. They are of a very dark shining green, and have a strong prominent pale coloured midrib. The Petioles are short and thick, a little flattened on the upper side, otherwise round, and of a pale green colour. Flowerbuds numerous, roundish-oval, rather more than an inch long, covered with roundish-cordate pale green densely pubescent scales. The flowers are of a fine dark rose or red colour, irregularly blotched with white, but in this respect they vary considerably, the autumnal, or early flowers, being always most elegantly variegated, whilst those which appear in the spring are generally plain red. They are from 3 to 4 inches in expansion. The outer petals are each about 1½ inch in diameter, almost flat, roundish-cordate, thick and fleshy at their base, and sometimes a little divided at their extremity; when the flower is fully expanded, they become recurved. The centre petals are often small, narrow, and upright, confusedly arranged, many of them being disposed in tufts, with small parcels of stamina intermixed, appearing as if they were twisted together. Some flowers are particularly handsome, and as double as a rose; others again will be found of an irregular shape, and little more than semi-double. In the latter state there is a good representation of one, having the centre filled with stamina, among the Chinese Drawings in the collection of the Society. This however is seldom or ever seen in the flowers produced in this country, as almost all the stamina are converted into small petals. The parts of each of them which are red are faintly marked with darker coloured veins, and when touched by cold, or as the flower begins to fade, the edges of the petals become slightly tinged with purple.

In some collections a variety of this sort is cultivated, having blotched or variegated leaves as well as flowers, but this character is by no means a permanent one, and in all probability arises from the plants being over-watered, and in an unhealthy state.

Figures of it will be found in ANDREW's *Botanist's Repository*, p. 91, LODDIGES's *Botanical Cabinet*, p. 329, and in CURTIS's Monograph, p. 2. Plants of it were among those imported for the Society in 1818, by Captain ASTEL, and others have been presented by W. CATTLEY, Esq. and Mr. CHANDLER, Vauxhall.

4. CAMELLIA JAPONICA RUBRA PLENA.

Double Red Camellia.

Some confusion exists with regard to this Camellia from its being cultivated in many Collections under the name of the *Old Red* and GREVILLE's *Red*, both being considered distinct varieties, but after having carefully compared the plants with those names, that were presented to the Society, and subjected to the same kind of treatment, I am satisfied there is no difference whatever between them, their flowers being precisely the same in every respect. It is of a free and robust habit, and grows very erect. The flowers are but sparingly produced before the plant gets old, and attains a considerable size; which is the reason of its not being so much cultivated as many of the other varieties.

The leaves are usually about 4 inches long and 2 inches broad, tapering to both ends, very sharp pointed, recurved, and undulated, with numerous small sharp serratures. They are of a brownish green when young, but when grown to their full size are of a dark shining green. The midrib is prominent and moderately strong. Petiole half an inch long, nearly round, and of a pale brownish green colour. Flower-buds oval, somewhat pointed, generally of a dull green,

and slightly clothed with pubescence, becoming brown before the flowers open, like the buds of the Waratah. The flowers are generally about 3 or 3½ inches in diameter, and open at the same time as those of the Waratah and Atro-rubens. They are of a crimson red colour, and resemble the flowers of a large Double Hibiscus. The petals are numerous, of an irregular shape, comparatively long, narrow, and pointed, all of them are veined. The exterior ones are seldom an inch in breadth when spread out, and do not lie flat over one another, but are much undulated, and unequal in length, which causes the flower to have a starry appearance. The interior petals are also undulated and pointed, with their edges compressed, so as almost to meet. They are nearly upright, and diminish in size towards the centre of the flower, which is not elevated, although it is more filled with petals than in those flowers, where it is pitted. Sometimes the flower has a different appearance, and is then mistaken for another variety, the petals being smaller than I have described, similar in colour and formation, but fewer in number, and more regularly arranged, with several parcels of stamina in the centre.

It was first imported in 1794 by Sir ROBERT PRESTON, Bart. of Valleyfield, who then lived at Woodford, in Essex. A good figure is given of it in the Botanical Repository, t. 199, and others have since been published in CURTIS's Monograph, p. 3; and in LODDIGES's Botanical Cabinet, p. 397; but in neither of these works is it mentioned as being like GREVILLE's *Red Camellia*, or that a variety similar to it was cultivated under that name.

5. CAMELLIA JAPONICA INCARNATA.

Lady HUME's *Blush Camellia.*

The first plant of this fine variety was imported in 1806, for the late Lady AMELIA HUME, of Wormleybury, in Hertfordshire, in honour of whom it received its name.

In growth and foliage it has much of the character of the Double White, and has been nearly as extensively cultivated, being found in almost every collection.

The branches are long and straggling, of a deep brown colour when young, but changing to a pale brown as they grow old. The leaves are from 3½ to 4 inches long, and about 2 inches broad in the widest part, which is nearest the point; recurved, and slightly undulated at the edges, with moderately large

serratures, and numerous prominent veins, considerably paler than the general colour of the leaves, which is a rich shining green. Petiole about three-quarters of an inch long, rounded on the lower side, and slightly flattened above. Flower-buds often two together, of a roundish-oval form, with broad roundish-cordate pale green pubescent scales, which become brown at the edges as the flower approaches expansion, and when it is fully expanded are entirely of a yellowish brown colour, to which the pubescence gives a delicate silvery tinge. The flowers are freely produced, and open very regularly; they are from 3 to $3\frac{1}{2}$ inches in diameter, of a fine glowing flesh colour, becoming richer as they expand, and fading if too much exposed. The outer petals are each about an inch in diameter, nearly round, and frequently a good deal recurved; towards the centre of the flower, which is pitted, as in the *Double White*, the petals gradually diminish in size, and are pointed. In general they are evenly arranged, and often when the flower is very double, the petals are laid over one another in such a manner as to give to it an hexangular appearance, similar to the flowers of the Myrtle-leaved variety, as represented by the Chinese, in the splendid collection of drawings belonging to the Society. In this state there is a figure of it in the *Botanical Register*, 112, but the leaves are by no means characteristic of it, being too strongly serrated and pointed; the same may be said of the figure in the *Botanist's Repository*, p. 660, f. 1, although they both convey a pretty clear idea of the appearance of the flower. It has been well represented by Messrs. Loddiges, in the *Botanical Cabinet*, p. 140, and by Mr. Curtis in his *Monograph*, p. 5.

Plants of it were received by the Society from Messrs. Loddiges, under the name of *Lady Hume's Blush Camellia*, and from Messrs. Chandler, by that of the *Buff Camellia*.

6. Camellia Japonica anemoneflora.

Anemone-flowered, or Waratah Camellia.

This is very distinct from any of the other Chinese varieties, and is always readily distinguished by its flat, and comparatively narrow, pointed leaves, with long slender footstalks. It is usually among the latest in coming into blossom, and does not produce its flowers so freely as some of the other red flowering kinds. In growth it is moderately strong and erect, the branches are of a dark brown colour, and sometimes a little striped.

The leaves are from 4 to $4\frac{1}{2}$ inches long, and about 2 or $2\frac{1}{2}$ inches broad, recurved at the points and edges, but otherwise quite flat, and of a very dark shining green colour, the veins being scarcely perceptible; the serratures

are small and sharp-pointed. The midrib is strong and prominent, particularly on the underside of the leaves, and of a pale green colour. The Petioles are an inch long, round and slender, somewhat curved, giving the leaves a pendent position. Flower-buds oval, tapering towards the point, with roundish pointed dark brown or chocolate-coloured scales densely clothed with pubescence. The flowers are remarkably shewy, and resemble a large Double Anemone, from which circumstance the variety has received its name. They are about 3 or 4 inches in diameter, and of a deep red colour. The outer petals expand quite flat, and are five or six, most commonly the former number, surrounding a great many smaller ones, regularly disposed and rising upright in the centre of the flower; each of them are roundish-cordate, from 1 to 1½ inch in breadth, and slightly marked with veins a little darker than the colour of the petal. Those in the centre of the flower are of a very peculiar form, being small and fleshy at the base, and broad and thin towards the point, with a very minute white tip; they are compactly arranged in rows from the circumference to the centre, which is considerably elevated above the large outer petals, and are each incurved towards the styles, with their edges turned outwards. The styles are a little higher than any of the petals, and have large greenish stigmas, which are sometimes fertilized by a few of the stamens that may not be transformed into petals—but more commonly they are impregnated by cultivators with the pollen of other sorts, and from the seed obtained in this way many beautiful double varieties have been raised. The flowers of this as well as of some of the other kinds drop off whole, and will retain their freshness for a considerable time afterwards, so that if placed upon a bud they appear still to be growing.

Good figures will be found of it in the Botanical Magazine, t. 1654, CURTIS's Monograph, p. 4, and in LODDIGES's Botanical Cabinet, t. 537. The Chinese represent it in the same state as it is usually seen in this country, as well as in a single state, with the stamina compactly arranged in the centre of the flower; but I am not aware of the latter having been observed on any of the plants that have been imported. For those in the garden the Society is indebted to Messrs. LODDIGES, of Hackney, Messrs. CHANDLER, Vauxhall, and W. CATTLEY, Esq. of Barnet. A plant was also presented by Mr. SAMUEL BROOKES, under the name of Blush Waratah, which on its flowering in 1827, was found not to differ from the present variety.

7. Camellia Japonica crassinervis.

Mr. Kent's *Camellia.*

This sort is so extremely like the Waratah in its flowers as to render a minute description of them unnecessary. The only difference appears to be that in the flowers of this variety the outer petals are more cupped and paler in colour than those of the Waratah. The habit and foliage of the two sorts is however perfectly distinct, so that when not in flower they may easily be distinguished from one another. The present is of free growth, peculiarly stiff and erect, with pale coloured branches. The leaves, which are nearly flat, are comparatively thinner and rounder than those of the Waratah. They are also more veiny on the upper side, as well as more sharply serrated, and have short, slightly flattened, not round and slender, footstalks. In colour and other respects the two sorts appear the same.

It is believed to have been imported by Captain Rawes about the year 1820, and to have flowered first in this country, in the collection of W. Kent, Esq. when at Clapton. It is generally cultivated under the name of "Kent's *Hexangular*." The plants of it in the Society's collection were presented by Messrs. Loddiges, who have given an excellent figure of it in their Botanical Cabinet, t. 1475.

8. Camellia Japonica myrtifolia.

Myrtle-leaved Camellia.

This sort is of a peculiar habit, and much less robust in its growth than almost any of the other Camellias. In certain soils, and under different kinds of treatment, it is liable to

vary a good deal both in its flowers and foliage, which has given occasion to suppose there were two varieties of it in cultivation, namely the *Large Myrtle-leaved* and *Small Myrtle-leaved*. The latter name however is only applicable to it when the plants are in a young state. They then have weak shoots, with leaves not much larger than those of the common Myrtle, but afterwards they lose this character, become more vigorous, and the supposed two varieties cannot be distinguished from one another. It seems to be rather tender, and succeeds best when the plants are kept warm and forwarded in their growth in the spring.

The branches are numerous and spreading, with convex, ovate, acuminate, sharply, serrated dark green leaves, generally about $2\frac{1}{2}$ inches long, and rather more than an inch broad, much twisted and recurved, with a strong prominent pale green midrib. The petioles scarcely half an inch long, nearly round, and of a brownish green on the exposed side. Flower-buds roundish oval, somewhat pointed; with large roundish pointed pale green slightly pubescent scales. The flowers are very freely produced, and large in proportion to the size of the plant, few of them being less than 3 inches in diameter. They are particularly handsome, and similar in their formation to those of the Double White. On first opening they appear of a deep rose colour, but when expanded become paler. The petals are numerous, and regularly arranged over one another, forming a peculiarly nice, even, and compact flower, faintly veined with red. The exterior petals are of a roundish form, always darker in colour than the interior ones. They are each about an inch broad, and become recurved after the flower has been sometime open. The interior petals are much smaller and pointed, and of a pale rose colour; at first they are erect, concave, and closely set together, so that the centre of the flower is considerably elevated; they afterwards expand almost flat, and leave a little hollow space in the centre, which is very often hidden by small, narrow, irregularly formed petals, with a yellowish tip, having the appearance of stamina. The flowers continue a long time in perfection, and are slightly fragrant.

It is generally believed to have been first imported in 1808, for the Royal Garden, Kew. A figure of it is given in the Botanical Magazine, t. 1670, made from a plant which flowered in the collection of Messrs. CHANDLER, at Vauxhall, in 1814. Another will be found in CURTIS's *Monograph*, p. 5,

but in neither of these works is it stated when it was introduced. A third figure has since been published in LODDIGES's *Botanical Cabinet*, p. 354, where it is mentioned as having been very rare in 1811, when Mr. AITON presented them with a cutting of it. A few years afterwards it was in great repute, and began to be common in the Nurseries about London. It is usually received from China for the *Hexangularis*, a variety no less remarkable for the regular disposition of its petals, than for the peculiar elegance of its flowers, which are admirably represented in the Society's collection of Chinese drawings. This variety however has not yet been imported, or at least the flowers have never been observed to become hexangular in this country. It might really be questioned whether they do so in China, if the drawings of the other sorts with which we are acquainted were not in general so accurate as to place the matter beyond a doubt.

Besides the plants of the Myrtle-leaved that were brought for the Society in 1818 by Captain ASTEL, and in 1821 by Captain JAMIESON, others were presented by W. KENT, Esq. Mr. CHANDLER, and Messrs. YOUNG, of Epsom. As the *Large Myrtle-leaved* and *Small Myrtle-leaved*, there were plants of it purchased from Mr. KNIGHT, in the King's Road, which on flowering proved to be both the same. Mr. LEE has subsequently presented the Society with a plant which is cultivated by him under the name of the *Large-flowering Myrtle-leaved*, but it does not appear to be different from the variety above described.

No. 1

No. 2

No. 3

No. 4

Blossoms of the various flowered Camellias.

9. CAMELLIA JAPONICA INVOLUTA.

Lady LONG'S CAMELLIA.

This sort was named in honour of Lady LONG, now Lady FARNBOROUGH, for whom the first plant of it was imported in 1820.

It has precisely the same characters as the Myrtle-leaved, of which it is but a variety, differing only in being rather more erect, and stronger in growth; and in having all the petals involute instead of spreading, as in the flowers of the Myrtle-leaved. This peculiarity gives to the flower a very distinct, although by no means a permanent character, as I have seen the same plant produce flowers with inflexed petals, and others that did not differ from those of the Myrtle-leaved.

A very correct representation of it is given in the Botanical Register, t. 633, made from the original plant that flowered at Bromley Hill in 1821; and a plant of it was presented to the Society by Lady FARNBOROUGH in 1823.

10. CAMELLIA JAPONICA VARIABILIS.

Various-flowered Camellia.

This kind is remarkable for producing no less than four different coloured flowers upon the same plant; and it is not improbable but the following four varieties represented in the annexed Plate, were originally obtained from it, namely, the Red, White, and Blush varieties of the Pæony-flowered, and the Pompone. They are each so much alike in growth, habit, and foliage, that they cannot possibly be distinguished from one another. It is only by their flowers they are to be known.

The present plant is of later introduction than either the Pompone or Pæony-flowered, and I believe was first imported for the Royal Garden, Kew, in 1816. In the same year I am informed by Mr. SABINE, another plant of it was brought home by Captain WELBANK, for CHARLES H. TURNER, Esq. of Rooksnest, which produced perfect flowers of the four above-mentioned varieties. I have also occasionally seen them on the plant presented to the Society by Mr. TURNER, in 1820, but generally it only produces those of the Red and Blush Pæony-flowered, and the Pompone.

11. CAMELLIA JAPONICA POMPONIA.

Pompone, or Kew Blush Camellia.

By many this has been considered a doubtful variety, but after having observed it for several years invariably produce the same sort of flowers, I am decidedly of opinion that in this respect it is as permanent and distinct a variety as any in cultivation.

In growth it is more slender and erect than almost any of the other sorts. The shoots are also of a paler colour, and but thinly clothed with foliage. It is believed to have been first imported for the Royal Garden, Kew, about the year 1810, and is generally known by the name of the Pompone, or Kew Blush Camellia.

The leaves although comparatively narrow are of an oval form, much recurved and pointed. They may be said to be usually about $3\frac{1}{2}$ inches long, and rather more than $1\frac{1}{2}$ inch broad, but seldom exceed this size. Their edges are slightly revolute, and very sharply serrated. The midrib and veins are conspicuous on the upper side, from being paler than the uniform colour of the leaves, which is always a peculiarly rich shining deep green. Petioles upwards of half an inch long, nearly round, or but a very little flattened on the upper side, and of the same colour as the veins and midrib. The flower-buds are at first a good deal pointed, but afterwards they become blunt and round. The scales are thin and

roundish, slightly covered with pubescence, and of a dull silvery green colour. The flowers are very delicate, and measure when fully expanded from three and a half to four inches in diameter. They consist of ten or twelve large outer petals, arranged in two rows round a great number of smaller ones that rise in the centre of the flower in an erect irregular mass. These outer petals are each of a roundish-cordate form, varying from an inch to an inch and a half in breadth. They are at first slightly concave, but spread open and become almost flat. In some flowers they are entire and recurved at the edges; generally however they are indented, or partially divided and undulated. Their colour is pure white, excepting for about a third of their length, nearest the base, which is deeply tinged with red, as well as a small stripe up the centre: the latter very often extends the whole length of the petal, and diminishes in brightness towards the edges. The centre petals are very different from those just described, and approach in some respects those of the Waratah, although by no means arranged with the same regularity as in the flowers of that variety. They are all closely united at the base, and rise nearly erect, so that the centre of the flower is considerably elevated above the two rows of large outer petals, some of them are more elongated than the rest and have a tubular appearance from their edges being rolled back and compressed together. The greater part however are nearly of equal height, and for half their length are of a roundish-oblong form, ending in a very narrow minute point. They are seldom coloured, unless it is one or two of the large tubular petals, which have the same blush tinge as those at the extremity of the flower. Occasionally a few perfect stamina may be observed, as well as the three united greenish styles; and some good varieties have been raised in this country from its seeds which sometimes attain maturity.

It has been figured in the Botanical Register, t. 22, in CURTIS's Monograph. p. 2, and in LODDIGES's Bot. Cab. 596.

The plants of it in the Society's collection were presented by Messrs. CHANDLER, Vauxhall, Mr. KNIGHT, King's Road, and others. It was also among those imported for the Society by Mr. POTTS in 1822.

12. CAMELLIA JAPONICA PÆONIFLORA ROSEA.

Red Pæony-flowered Camellia.

13. CAMELLIA JAPONICA PÆONIFLORA PALLIDA.

Blush Pæony-flowered Camellia.

14. Camellia Japonica Pæoniflora alba.

White Pæony-flowered Camellia.

These three varieties are in every respect the same as the Pompone. The only difference appears to be in the colour of their flowers, which I shall here briefly notice. That of the first is a bright rose or red colour, marked with darker coloured veins. It is tolerably well represented in the Botanist's Repository, f. 660, and in Loddiges's Botanical Cabinet, t. 238. Plants of it were presented to the Society by W. Cattley, Esq. Messrs. Loddiges, and other Nurserymen. It is believed to have been first imported for Charles H. Turner, Esq. about the year 1810.

The second variety is intermediate in the colour of its flowers, between the last mentioned and the Pompone, being darker than the Pompone, yet not so dark as the Red Pæony-flowered. The whole of the petals are veined, and of a deep blush colour excepting the edges, which are nearly white. It was first imported for the Society in 1820, by whom plants of it have been distributed, but it is not so much known as it really deserves to be.

The third variety is generally cultivated under the name of the *White Waratah*, or *White Anemone-flowered*. It was presented to the Society by Messrs. Loddiges as *White Pompone*. A plant of it was brought home by Mr. Potts in 1822, but it is supposed to have been first introduced to the Kew Garden, with the other Pæony-flowered varieties about the year 1810. The flowers are exactly the same as

those of the Pompone, excepting that they are pure White, and have not the blush tinge at the base of the petals, which is peculiar to the Pompone.

15. CAMELLIA JAPONICA SEMIDUPLEX.

Semi-double Red Camellia.

This plant is so very like what is usually known as MIDDLEMIST's Red Camellia, that it is not easy to distinguish them from one another unless when in flower. They are however perfectly distinct. The present variety is of free growth, more so indeed than almost any of the others; the shoots are erect, and of a pale brown colour. The flowers are produced but sparingly, and it is rather late in the season before they open.

The leaves are comparatively round, convex and ovate, broadest at the base. They are about $3\frac{1}{2}$ inches long, and $2\frac{1}{2}$ inches broad, much recurved at the edges. The serratures at the base of the leaf are blunt and indistinct, but become strong and sharp towards the point, which is narrow. The colour of the leaves is a very dark shining green, with a peculiar palish hue, which together with their convexity, gives them a character by which they may generally be recognized. The petioles are half an inch long, slightly channelled above, and of a dull green colour, somewhat paler than that of the leaves. The flower buds are large, oval, and pointed, of a pale green, with but little pubescence. The scales frequently become brown at the edges before the opening of the flower. The flowers consist of from 6 to 12 large roundish petals, ranged in a single or double series, round the cup or column of stamina, and expanding to about $2\frac{1}{2}$ inches in diameter. Each of these petals is rather more than an inch broad; sometimes they are a little recurved, but generally they are concave, and all marked with veins that are darker than the uniform rich rose colour of the flower. The column of stamina rises erect, as in the centre of the flowers of the Common Single Red Camellia, but instead of having yellow anthers, they are each transformed, together with the upper part of the filament which is dilated, into small roundish ligulate petals, slightly divided at their extremity, and striped with white in the same manner as the petals of Middlemist's Red, but not so large, nor are the petals so numerous.

It has been impregnated with the pollen of the Single White, and some excellent varieties have been raised from

its seed by Mr. PRESS, the gardener to EDWARD GRAY, Esq. at Harringgay House, Hornsey.

It was introduced in 1808, for the Hon. CHARLES GREVILLE, who then possessed a choice and valuable collection of plants at Paddington. A figure of it is published in the Botanist's Repository, t. 559, made from a plant which flowered in the collection of Mr. DAVEY, of the King's Road. The figure is pretty well done, and represents the stamina just converted into petals. Mr. DAVEY is stated to have grown it from a cutting of a plant brought by some gentleman from China, but no date is given when it was imported.

16. CAMELLIA JAPONICA CARNEA.

MIDDLEMIST'S *Red Camellia.*

This variety, as stated by Messrs. LODDIGES, in their Botanical Cabinet, was formerly cultivated under a multitude of names, such as the Rose, the Pink, the Fawn-coloured, Pæony-flowered, &c. but is now commonly known by the name I have adopted.

In growth, habit, and foliage, it has a great resemblance to the Semi-double Red. The shoots are vigorous and erect, and when the plants attain a large size they flower freely, but in a young state the flowers are sparingly produced. The flower-buds are nearly round and of a dull pale green, covered with several roundish slightly pubescent scales, which sometimes are tinged with brown at the edges. The flowers open much about the same time as those of the Semi-double Red, and are similar in colour but larger, usually measuring 3 inches or more in expansion. The outer petals are roundish-cordate, and upwards of an inch in diameter; before the flower opens fully they are concave, and arranged regularly in circles over one another. They are not numerous, although the flower may always be said to be more than semi-double. The centre petals are short, and vary in their form, generally they are roundish and a little twisted, as well as marked with dark coloured veins, and all of them more or less have a small white stripe down the centre. The stamina are at times perfect, but more often are transformed into petals, and the whole altogether resemble a full blown Rose.

In the Botanical Register, p. 22, it is improperly referred to as the Pæony-flowered. A figure of it is published in the Botanist's Repository, 660, f. 1, as Rose-coloured Camellia, where it is stated to have been introduced to Kew about 1808. Another figure is given of it in CURTIS's Monograph, pl. 4, as the Rose-coloured, or MIDDLEMIST's Camellia; and in the enumeration of the varieties then known, inserted at the end of that work, on the authority of the late Mr. LEE, of Hammersmith, it is stated not to have been introduced until 1810; but the original introducer of it, Mr. MIDDLEMIST, Nurseryman, at Shepherd's Bush, informs me that he brought it home for the Kew garden in 1808.

17. CAMELLIA JAPONICA ATRORUBENS.

LODDIGES's *Red Camellia.*

This is a vigorous growing sort, having long thick erect shoots, of a pale brown colour, somewhat striated. It is always among the latest in coming into blossom, opening about the same time as the Waratah. The flowers are not very freely produced, but it is nevertheless a handsome and desirable variety.

The leaves are ovate, large and flat, a little recurved at the point, and sharply serrated. They are usually 4½ inches long, and 2½ inches broad, of a dark green colour, not very glossy, with a moderately strong midrib, and numerous prominent pale veins. The petioles are nearly an inch long, slightly curved at the base of the leaf, and of a dull green colour. The flower buds are oval, somewhat pointed and pubescent; at first of a dark green, but change to a deep chocolate colour, like the buds of the Waratah. The flowers are generally middle sized, and seldom exceed three inches in diameter. They are very striking at a distance, appearing scarlet. The outside petals of a thick substance, and expand well; each of them is roundish oblong, about an inch broad, with the edges sometimes notched and slightly undulated. The whole are ranged in a double or triple series, and like most of the other sorts are faintly marked with dark veins. The interior of the flower is filled with small petals confusedly mixed together, varying a good deal both in their size and form, but resembling

in some respects the centre petals of the Waratah, each being incurved and having a very minute white tip. Sometimes from amongst them a few larger elongated ligulate petals burst out, intermediate in character and shape between those at the circumference of the flower and those in the centre. These are rather of a paler colour, and arranged in a cluster overtopping the others, presenting the appearance of a second flower growing out of the centre. In its usual state the whole flower is very neat and shewy.

It has been figured by Messrs. Loddiges in their Botanical Cabinet, t. 170, and was originally imported by them from China in 1809. The plants of it in the Society's collection were received from Messrs. Loddiges, and from Messrs. Chandler, Vauxhall.

18. Camellia Japonica Welbankii.

Welbank's *White Camellia.*

This sort differs very considerably from any of the other White-flowering kinds. It is of a robust habit, and grows very stiff and erect. The branches are of a dark brown colour when young, but change and become paler as they grow old. The foliage, from its convexity, is so peculiar as to give a character to this variety, by which it may at all times be readily distinguished. It does not appear to flower freely, and on this account it is not so much cultivated perhaps as it deserves.

The leaves are ovate, from $3\frac{1}{2}$ to four inches long, and rather more than two inches broad, similar in colour to those of the Pompone, but much more convex and not so sharply serrated or pointed. The midrib is prominent and strong, particularly on the lower side of the leaf. The footstalk is about half an inch long, nearly round, and of a pale green colour. The flower buds are large, roundish oval, covered with several broad and round pale green pubescent scales. The flowers are of a yellowish white colour, and about three or three and a half inches in diameter. They may be said to rank between the Double White and the Pompone, assimilating more with the latter than the former, but perfectly distinct from either. The petals are not arranged in any sort of order, so that the flower has a confused appearance. Those at the circumference are of a roundish form, from an inch to an inch and a half in diameter, much undulated and but very little recurved or divided at their extremity. The centre petals are irregularly

shaped; sometimes they approach to those of the Pompone, but are often twisted and arranged in tufts, with several parcels of imperfect stamina intermixed among them. It is upon the whole very delicate, and has been not inaptly compared by Messrs. LODDIGES to the flowers of the Gardenia florida in form and texture.

It was imported in 1820 by Captain WELBANK and by Captain RAWES, the former presented his plant to his friend CHARLES HAMPDEN TURNER, Esq. of Rooksnest, in whose Greenhouse it flowered first in this country, and was named in compliment to the gentleman by whom it was introduced.

A figure of it will be found in LODDIGES's Cabinet, t. 1198, and another in the Botanical Register, t. 708, under the name of *luteo-albicans*, where it is erroneously stated to have been introduced by the late Mr. BASINGTON, Nurseryman, at Stoke Newington. For the plants of it in the garden the Society are indebted to Mr. TURNER. It was subsequently imported for the Society by Captain FRANKLIN, under the name of *White Moutan Camellia*.

19. CAMELLIA JAPONICA ROSEA.

LE BLANC'S *Red Camellia*.

The present variety, although not so shewy as many that are described in this Paper, is nevertheless very desirable, from producing its flowers both early and abundantly.

The branches are of a pale brown colour, not vigorous, but rather small and erect. The leaves are of a rich shining green, and comparatively narrow, being for the most part 4 inches long, and scarcely 2 inches broad. They are much reflexed and curved, as well as very sharply serrated, and taper to a long narrow point. The midrib and veins are strong and prominent, which occasion the leaves to have a netted appearance. The petioles are short and slender, a little flattened on the upper side, and of a dull pale green colour. The flower buds are small and numerous, of an oval form, with moderately large roundish pale-green pubescent scales, often tinged with brown at the edges. The flowers when fully expanded, measure from $2\frac{1}{2}$ to 3 inches in diameter, and are of a pale rose colour,

approaching that of the Myrtle-leaved. Before they open the petals are compactly curved over one another in such a manner as to give to the flower the appearance of a small Cabbage Rose; a peculiarity which it is not unusual for some of the flowers to retain in a greater or less degree until they drop; generally however the outer petals unfold and spread nearly flat. They are each roundish cordate, about three-fourths of an inch in breadth, and sometimes have a faint greenish stripe down the centre. The whole of the petals are similar in form, and very evenly arranged, diminishing regularly in size towards the centre of the flower, which is occasionally pitted and not so full of petals as in some of the other varieties.

It was imported for the Society in 1821, by Captain Thomas Le Blanc, in compliment to whom it has received its name.

20. Camellia Japonica speciosa.

Rawes's *Variegated Waratah.*

This fine variety was imported by Captain Rawes in 1824, and presented to his friend Thomas Carey Palmer, Esq. in whose Greenhouse at Bromley it flowered in March 1826, and an opportunity was kindly afforded me of describing it.

The plant in general appearance is very distinct from any of the other imported varieties, and like them may at once be distinguished by the leaves, which are comparatively thin and of a bright vivid green. They are for the most part nearly flat and ovate, broad at the base, and becoming somewhat narrower towards the point; sometimes a few of them are slightly recurved; the serratures are shallow, small, and sharp, becoming indistinct near the base of the leaf. The midrib and veins are of a palish green, not very prominent, nor so strong as in some of the other kinds; the usual size of the leaves is about 3½ inches long, and 2½ inches broad. The petioles are roundish and slightly hollowed on the upper side, generally half an inch long, and of the same colour as the midrib and veins. Flower-buds oval with a blunt point; the scales are dull green, roundish cordate, slightly pubescent, and at the edges which are thin, frequently have a brownish tinge. The flowers are exceedingly handsome, and of a deeper red than either Atro-rubens or Waratah, but approaches in some degree those of the latter. They open very regularly, and when expanded are usually 4 inches in diameter. The outer petals vary from an inch to an inch and a half in breadth, and are sometimes slightly cordate, but most generally rounded at the edges, a little recurved, and faintly veined. These large outer petals are from 10 to 12 or more in number, and are placed in two or three rows rather irregularly over one another, with a few unequal blotches of white appearing on some of them near the edges; above these there is another row of small incurved petals like

those of the Waratah, three-quarters of an inch in thickness, which rise upright and become larger the nearer they approach the centre of the flower; from these proceed 8 or 10 petals, nearly as large as those at the extremity, and surround another set of small incurved petals, thus having the appearance of two flowers, one of which is formed in the centre of the other. The second row of large petals does not lie flat like the first, but is somewhat concave; nearly the whole of them have a little white stripe at their base, and some will even be variegated up the centre; both the exterior and interior petals are tipped with white in the same manner as those of the Waratah.

A plant of it was presented to the Society in 1828 by Mr. PALMER, and two were received from Mr. REEVES, which have every appearance of being the same, but they have not yet blossomed in the garden.

The name has been given in compliment to Captain RAWES, than whom there is no one more deserving of the honour.

21. CAMELLIA JAPONICA IMBRICATA.

Crimson Shell Camellia.

This fine variety is one of those imported for the Society in 1824, by Mr. JOHN DAMPER PARKS. It flowered in March 1827, and is without doubt among the best which have yet been brought from China.

The plant is of vigorous growth, with large thick dark green leaves, usually 4½ inches long, and from 2 to 2½ inches broad, waved and tapering to a sharp point; the serratures are shallow and blunt, and in the old leaves scarcely discernible, particularly towards the petiole. The midrib is prominent and strong, particularly on the under side, and much paler than the leaves. The petioles are also of a palish green, thick and strong, usually about three-quarters of an inch in length, nearly round, excepting on the upper side, which is slightly channelled. The flower-buds are almost round and very large; the scales are also round, slightly pubescent, and of a palish green, becoming a little brown at the edges, as the flower opens, and sometimes tinged with red. The flowers are upwards of 3½ inches in diameter, and extremely regular in their formation, the petals being ranged one above another, and gradually diminishing in size towards the centre, exactly in the manner of the Double White. The colour is a fine crimson red, and remarkably shewy. The outer petals are nearly round and are each upwards of an inch in diameter. When the flower first begins to open they are all cupped or concave, but as it expands they become quite flat, and those at

the extremity are a little recurved. The centre petals are somewhat pointed, and rise upright. They are so thick that not a single stamen is to be observed. Some of the petals in the middle, between the centre and circumference of the flower, have a faint white stripe extending from the tip of the petal for about half its length down the centre, but partially hidden by the other petals covering it; this stripe however is permanent, but disappears when the flower is fully expanded, or at least becomes slightly coloured. The centre of the flower is cupped, and the arrangement of the petals altogether is precisely the same as in the flowers of the Double White.

Among the Chinese drawings in the Library of the Society is a very faithful representation of this variety, besides many more equally beautiful, which we may yet hope will be introduced.

XXII. Camellia Japonica Parksii.

Park's *Striped Rose Camellia.*

This variety differs very materially from the Common Double Striped, from which it may readily be distinguished by its strongly reticulated thin round leaves. The shoots are of a pale brown colour, moderately strong, and nearly erect.

The leaves are roundish-ovate, usually about $3\frac{1}{2}$ inches long, and rather more than 2 inches broad, of a bright shining green, veiny on the upper side, with shallow serratures; midrib pale green, strong and prominent beneath. Petioles about half an inch long, moderately thick, and slightly channelled above. Flower-buds roundish-oval, tapering to a point, dark green at first, and only slightly pubescent, but gradually becoming paler and more pubescent as the flower approaches expansion; they are usually about an inch in length. Flowers opening well, and measuring 4 inches in diameter when fully expanded. They are of a bright rose colour, irregularly striped or blotched with white. The outer petals are comparatively large, being for the most part 2 inches in diameter, and even sometimes exceeding that size, slightly cordate, occasionally having a jagged or fringed edge. Those toward the centre of the flower are irregular in their form, partly twisted and disposed in a similar manner to those of the Common Striped, giving the whole flower the same confused appearance, and shewing a few imperfect stamina in the hollows formed by the twists of the petals. The veins are scarcely discernible in any of the petals. Upon the whole this is a very handsome variety, and will no doubt be much admired when it becomes more generally known. It possesses a slight but very pleasant smell, which I have only remarked in another variety besides itself, namely the Myrtle-leaved.

A plant of it was imported for the Society in 1824, by their collector, Mr. John Damper Parks, in compliment to whom it has been named.

23. Camellia Japonica Sabiniana.

Sabine's *White Camellia.*

A plant of this variety was brought home by Mr. Parks along with the two preceding in 1824, but from being in a sickly state when received, it did not flower until the spring of the present year. It is very different from any of the other white flowering kinds both in habit and general appearance.

The branches grow upright, and are comparatively slender. The leaves are about the same length as those of the Double White, but they are broader and not so much pointed or recurved. Their colour is a dark shining green, without the veiny appearance peculiar to the leaves of the Double White. Petioles short and almost round. Flower-buds roundish-oval, pale yellowish green, and slightly pubescent. The flowers are three inches in expansion, of a pure white colour, and resemble in their form those of the Pompone. The outer petals are disposed in two rows, and spread nearly flat. They are about twenty in number, each of them is round, or but a very little cordate, and about an inch and a half in diameter. Those towards the centre of the flower are small and narrow, confusedly arranged like the centre petals in the flowers of Welbank's *White*, and rise nearly upright; a few of them are small and incurved, with their sides compressed so as almost to have a tubular appearance. In the centre of the flower several small parcels of stamina sometimes appear; generally however they are mixed among the petals, so as not to be discernible unless when closely examined.

The name, as I have in another place observed, is given in honour of Joseph Sabine, Esq. the Secretary of the Society.

THEA.

The name Thea, as remarked by Sir James Edward Smith, is generally considered to be of barbarous derivation, originating in the Chinese *Tsha* or *Tchaw*, which has been changed into Thea. Of this Genus there are at present three

distinct species cultivated in this country, namely, 1. Thea viridis; 2. Thea Bohea; and 3. Thea Euryoides; which may be distinguished by the following characters.

Essential Character.

Flowers axillary stalked. *Calyx* inferior, of 5 deeply divided permanent roundish segments. *Corolla* of 5, 6, or 9 petals. *Styles* cohering at the base, dividing towards the point into 3 distinct bodies. *Capsule* 3-lobed 3-celled. *Seeds* solitary.

I. Thea viridis. *L.*

Green Tea.

T. *viridis;* foliis elliptico-oblongis emarginatis sub-rugosis nitidis.

This plant is generally believed* to have been first introduced about 1768, by the late John Ellis, Esq. of the India House, who obtained it from seed.

In its growth it is loose and straggling. The stem is of a deep brown, with alternate branches of a much paler colour, round and twiggy, but not numerous, smooth, excepting near the point of the young shoots, which are clothed with fine silky pubescence. The leaves are oblong, tapering more towards the point than the base, usually from 3 to 3½ inches long, and about 1½ inch broad in the widest part; quite smooth, veiny, undulated, irregularly serrated, with a blunt emarginate point, and of a pale yellowish green colour. They are slightly blistered in places, and have a very prominent midrib, the under side being more veiny than the upper. Petioles short, roundish on the under side, slightly flattened above, channelled and pubescent. Flowers axillary, but often terminal, solitary, produced on a round peduncle an inch long, having somewhat the appearance of being jointed, and gradually enlarging towards the calyx, with a single erect subulate slightly serrated bractea. Calyx of 5 roundish flat obtuse permanent segments. Petals generally 5 or 7, roundish-concave, forming a tolerably regular flower on first opening, but afterwards becoming recurved and irregular; the petals are rather more than half an inch in diameter, connected together at the base, which is thick and fleshy, but otherwise they are thin and delicate, and of a yellowish white colour. Filaments numerous, filiform, nearly all of an equal length, rather shorter than the petals. Anthers two-lobed, deep yellow, bursting at each of the roundish ends. Styles simple, united at the base, but splitting near the top into three separate bodies. Ovary small, roundish, pale green, slightly pubescent, 3-celled, containing two ovules in each cell.

* Hortus Kewensis, Edit. alt. Vol. III. page 303.

The flowers of this species, though neither shewy nor handsome, possess a most delicious fragrance like those of the orange, which renders it a very desirable plant for cultivation. It is much hardier than the other species, and will even bear the winters of this climate without protection.

A very good representation is given by Dr. LETTSOM, in his Natural History of the Tea Tree, and another has subsequently been published by Messrs. LODDIGES, in their Botanical Cabinet, fol. 227. It is the Thea viridis of LINNÆUS and of WILLDENOW; the Thea Bohea stricta of the Hortus Kewensis; and the Thea Chinensis viridis of the Botanical Magazine, and of M. DECANDOLLE.

II. THEA BOHEA.

Bohea Tea-tree.

Th. *Bohea;* foliis elliptico-lanceolatis serratis planis nitidis.

This species differs widely from the one already described, although by many it has been confounded with it. In its growth it is much more lax and upright, and produces its flowers in greater abundance; they also do not open till a month after those of Thea viridis. It is recorded in the Botanical Cabinet, vol. 3, p. 226, not to have been introduced until 1780. It is by no means so hardy as Thea viridis, and requires to be kept in a warm and airy situation, in the Greenhouse or Conservatory, during winter.

The leaves are alternate, elliptic-lanceolate, serrate (not emarginate as those of *Thea viridis*) nearly flat, quite smooth on both sides, coriaceous, and of a very dark shining green; they are usually 2½ inches long, and nearly an inch broad, with a prominent midrib, and pale green; the under side of the leaf is also much paler and more glossy than the upper. The flowers are axillary, usually two or

three together, produced on round recurved footstalks, about half an inch in length, and of a brownish-green, very slightly pubescent. They are each an inch in diameter, and consist of seldom more than five roundish-oval, concave, yellowish-white petals, which as the flower gets old, become reflexed and much twisted. The stamina are numerous, rising close and upright, surrounding the style as in the flowers of Camellia. Anthers large, roundish cordate, deep yellow. Style united at the base, but dividing into three separate bodies towards the top, as in Camellia, greenish, and rather shorter than the stamina. Ovary 3-celled, containing two or more ovules in each.

In the Botanical Magazine, t. 998, this species is figured and described under the name of Thea Chinensis var. Bohea, but it is very doubtful whether the figure was not actually made from a species of Thea viridis, to which it has a greater resemblance. It is the *Thea Bohea* β *laxa* of the 2nd Edition of the Hortus Kewensis, vol. 2, p. 230. A good figure will be found of it in the Botanical Cabinet, p. 226, and a very faithful one is given by Kæmpfer in his Amœnitates Exoticæ, 605, t. 606. The *Thea Cantoniensis* described by Loureiro in his Flora Cochinchinensis, p. 414, is very nearly allied to this plant, if it is not actually the same.

III. Thea Euryoides.

Camellia Euryoides. Bot. Reg. t. 983.

Th. *Euryoides;* ramis debilibus pilosis, foliis ovato-lanceolatis acuminatis truncatis serratis subtus sericeis, floribus solitariis turbinatis, pedunculis squamosis. *Lindl. in Bot. Reg.* t. 983.

This interesting plant was first imported by the Horticultural Society in 1822, and produced its flowers in March 1826, when a drawing was made of it, which has since been published in the Botanical Register, t. 983, under the name of Camellia Euryoides; but I am inclined to think its character will be found to agree in more points with those of Thea than with Camellia, and for this reason I have considered it as belonging to the former. It possesses little beauty,

but is well deserving of attention as it appears to be one of the plants upon which the Chinese graft their varieties of Camellia Japonica. Of this there is no doubt, as it was obtained in two separate importations by the Society, the first in 1822, and the second in 1824, and both under similar circumstances; the grafted portion of the Camellia having died during the voyage, and this plant, which was the stock, having survived.

The whole plant is of weak growth, with round pendulous hairy branches, of a deep brown colour. The leaves are each about 2½ inches long, ovate-lanceolate, truncate, and simply serrate; on the upper side they are of a deep and somewhat shining green, quite smooth, and without veins. The under side is much paler, and densely covered with pubescence, as are likewise the petioles, which are usually about a quarter of an inch long, rounded below, and slightly hollowed above. The flowers are white, axillary, and solitary, on short round petioles, imbricated with small, pointed, oval, silky scales; and having a 5-leaved calyx, with roundish-oval sepals. The petals are from 7 to 8 in number, erect, obovate, and entire, each of them measures about a quarter of an inch in breadth in the widest part, but the outer ones are usually much smaller, and the whole expansion of the flower is never more than half an inch.

A very correct figure of it will be found in LODDIGES's Bot. Cabinet, t. 1493, under the name of Camellia Euryoides.

Besides these three species, there have been two others that have been described as belonging to Thea, namely, *T. Cochinchinensis*, and *T. oleosa* of LOUREIRO, *Fl. Cochin.* Vol. 1, p. 413. They have been taken up by M. DECANDOLLE in his Prodromus, Vol. 1, p. 530 on LOUREIRO's authority. His *Thea oleosa* has been supposed to be the *Camellia Sasanqua*, but the other remains undetermined.

The Thea Bohea and viridis are the plants whose leaves furnish the whole of the kinds of Tea imported from China. Its first introduction into Europe was by the Dutch East India Company in the early part of the 17th Century, and it

is mentioned to have been first brought to England by Lord Arlington and Lord Ossory in 1666. Shortly afterwards it began to be much used among the higher classes, but its properties were little known until the appearance of Dr. Lettsom's Monograph in 1799, which contains much curious information. This author has fallen into the same error as those who preceded him, in considering that there was only one species of the Tea plant, and that the difference was owing to soil and culture, and the manner of drying the leaves. Those who have seen the two species in a living state readily agree in considering them distinct.

Respecting the size to which the Tea tree will attain in China, Authors differ widely.

Le Compte says (*Journey in China*, p. 228) it grows from 2 to 200 feet in height, and sometimes so thick that two men can scarcely grasp the trunk in their arms; but he afterwards observes that the Tea trees in the Province of Tokien did not exceed five or six feet in height, which appears to be much nearer the truth, and agrees with the account given by Kæmpfer in his Amœnitates Exoticæ, p. 605, and by Osbeck in his Voyage to China, Vol. 1, p. 247. It is cultivated principally in vallies, or on the declivities of hills, having a southern exposure to the sun, and is said to bear considerable variations of temperature, flourishing in the northern climate of Pekin as well as about Canton.

LVI. *Upon the supposed Changes of the Climate of England. By* Thomas Andrew Knight, *Esq. President, F. R. S. &c.*

Read May 5, 1829.

There are, I believe, few persons who have noticed, and who can recollect, the state of the climate of England half a Century ago, who will not be found to agree in opinion that considerable changes have taken place in it; and that our Winters are now generally warmer than they were at that period. The opinions of such persons would be entitled to very little attention if they were adduced to prove that our climate has grown colder, because they themselves being far advanced in life, and therefore less patient of cold, and being also incapable of bearing the same degree of exercise which kept them warm in youth, might be readily drawn to conclude that the severity of our winters has increased. But when their evidence tends to prove that our winters have grown warmer, it cannot, I think, reasonably be rejected. My own habits and pursuits, from a very early period of my life to the present time, have led me to expose myself much to the weather in all seasons of the year, and under all circumstances; and no doubt whatever remains in my mind but that our Winters are generally a good deal less severe than formerly, our Springs more cold and ungenial, our Summers, and particularly the latter parts of them, as warm

at least as they formerly were, and our Autumns considerably warmer; and I think that I can point out some physical causes and adduce some rather strong facts, in support of these opinions.

The subject is one of much importance to the Horticulturist, as it points out to him in what respects he ought to deviate from the practice of his predecessors, and the expediency of creating, or selecting, such varieties of different species of fruits as are well adapted to the present state of his climate.

As the chief object of this Communication is to direct the attention of the Gardener to the subject of Fruit Trees, I shall begin my observations upon that part of the year in which the blossom-buds of the succeeding year are generally formed and closed up (though much change of structure within them subsequently takes place) that is in the latter end of May. Within the last fifty years very extensive tracts of ground, which were previously covered with trees, have been cleared, and much waste land has been enclosed and cultivated; and by means of trenches and ditches and other improvements in agriculture and covered drains, the water which falls from the clouds, and that which arises in excess out of the ground, has been more rapidly and more efficiently carried off than at previous periods. The quantity of water which our rivers contain and carry to the sea in Summer and Autumn, is in consequence, as I have witnessed in many instances, greatly diminished; and upon the estate where I was born, and which I now possess, my title deeds, and the form of the ground, prove a mill to have stood, in the reign of Queen Elizabeth, and probably at a good deal later

period, in a situation to which sufficient water to turn a mill-wheel one day in a month cannot now be obtained in the latter part of the Summer and Autumn. Under these circumstances the ground must necessarily become much more dry in the end of May than it could have been previously to its having been enclosed and drained and cultivated; and it must consequently absorb and retain much more of the warm Summer rain (for but little usually flows off) than it did in an uncultivated state; and as water in cooling is known to give out much heat to surrounding bodies, much warmth must be communicated to the ground, and this cannot fail to affect the temperature of the following Autumn. The warm Autumnal rains, in conjunction with those of the Summer, must necessarily operate powerfully upon the temperature of the succeeding Winter; and, consistently with this hypothesis, I have observed that during the last forty years, when the weather of the Summer and Autumn has been very wet, the succeeding Winter has been in the climate of this vicinity generally mild. And that when north-east winds have prevailed after such wet seasons the weather in the Winter has been cold and cloudy, but without severe frost, probably in part owing to the ground upon the opposite shores of the Continent being in a state similar to that on this side the Channel.

I was first led to notice the preceding effects by having observed, many years ago, that some trees of the common Laurel, which grew in a very high and cold situation, and which usually lost a very large portion of the annual wood, in more than one Winter totally escaped all injury after such wet seasons, though their annual wood did not appear more

mature in the end of November, than it would have been, in a warm and favourable situation and season, in the end of July; and I thought the whole of it must have inevitably perished.

Supposing the ground to contain less water in the commencement of Winter on account of the operation of the drains above-mentioned, as it almost always will, and generally must do, more of the water afforded by dissolving snows, and the cold rains of Winter, will be necessarily absorbed by it; and in the end of February, however dry the ground may have been at the Winter solstice, it will almost always be found saturated with water derived from those unfavourable sources; and as the influence of the sun is as powerful on the last day of February, as on the 15th day of October, and as it is almost wholly the high temperature of the ground in the latter period, which occasions the different temperature of the air in those opposite seasons, I think it can scarcely be doubted that if the soil have been rendered more cold by having absorbed a larger portion of water at very near the freezing temperature, the weather of the Spring must be, to some extent, injuriously affected. But whether it be owing to the preceding, or other causes, I feel most perfectly confident that the weather in the Spring has been considerably less favourable to the blossoms of Fruit Trees, and to vegetation generally, during the last thirty years, than it was in the preceding period of the same duration; and I shall in conclusion adduce one fact, the evidence of which I think cannot easily be controverted. The Herefordshire farmers formerly calculated upon having a full crop of acorns upon the oaks, which grew dispersed over their farms, once in three years;

but a good crop of acorns is now a thing of rare occurrence, upon the value of which the farmer has almost wholly ceased to calculate, even upon those farms which contain extensive groves of Oaks. The trees nevertheless blossom annually very freely, but no fruit is produced. Many causes may be assigned for the diminished produce of Orchards, and of Fruit Trees generally; but the blossoms of the Oak must be now as capable of bearing cold as they were half a century ago, and their failing to produce acorns can only be attributed to the agency of some external cause; and I am wholly unable to conjecture any such cause except the above-mentioned.

LVII. *Upon the Application of Hot Water in Heating Hot-houses. In a Letter to the Secretary. By Mr.* Thomas Tredgold.

Read August 5, 1828.

Sir,

A new method of applying heat to the purposes of forcing and preserving Plants in houses having been discovered which possesses some important advantages compared with the best method before in use; and the first instance of its successful application under the direction of Mr. W. Atkinson, its discoverer, having been published in the Transactions of the Horticultural Society,* it appeared to me that the principles of the method would form an interesting inquiry which might not be altogether unworthy of your attention.

1. The power of imitating other climes and other seasons than those which nature affords us, is known and valued as it ought to be; yet it remains difficult even to imagine the extent to which this power may be applied; in this age it produces luxuries of which few can enjoy more than the commonest species; but in the next—nay, even in our own, there is a reasonable expectation of a considerable addition to the quantity and quality of those artificial productions, as well as to the vast sources of pleasure and information they afford to the admirers and the students of nature.

2. The vehicle employed to convey and distribute heat in

* Vol. VII. p. 203.

the new process is water, for it has been found that in an arrangement of vessels connected by pipes, the whole of the water these vessels and pipes contain may be heated by applying heat to one of the vessels; and that in this manner a great extent of heating surface, and a large body of hot water to supply it, may be distributed so as to maintain an elevated and regular temperature in a house for Plants, or indeed in any other place requiring heat.

3. The obvious advantages of this method are, 1st, the mild and equal temperature it produces; for the hot surface cannot be hotter than boiling water; 2nd, the power of heating such a body of water as will preserve the temperature of the house many hours without attention; and, 3d, the freedom from smoke or other effluvia of smoke flues. In houses for plants these advantages are most important, and my object is to investigate the principles called into action to produce them, to the end that we may be able to regulate their operation in the various particular cases arising in practice.

4. In order to develope the principles on which a hot-water apparatus acts, we may select the simple case of two vessels placed on a horizontal plane, with two pipes to connect them; the vessels being open at the top, and the one pipe connecting the lower parts of the vessels, and the other their upper parts.

If the vessels and pipes be filled with water (fig. 1,) and heat be applied to the vessel A, the effect of heat will expand the water in the vessel A; and its surface will in consequence rise to a higher level *a a*, the former general level surface

being *b b*. The density of the fluid in the vessel A, will also decrease in consequence of its expansion, but as soon as the column *c d* of fluid above the *centre of the upper pipe* is of a greater weight than the column *f e* above that centre, motion will commence along the upper pipe from A to B, and the change this motion produces in the equilibrium of the fluid will cause a corresponding motion in the lower pipe from B to A ; and, in short pipes the motion will obviously continue till the temperature be nearly the same in both vessels, or if the water be made to boil in A, it may also be boiling hot in B, because ebullition in A will assist the motion.

5. The causes which tend to retard the motion of water in the pipes are, 1st, the contraction of the moving fluid at the orifice of the pipes; 2nd, the friction of the fluid in the pipes, which sets the limit to the distance to which the pipes can be extended to produce the proper quantity of useful effect; but, it is remarkable that the higher the temperature of the moving fluid the less its friction; 3rd, the motion is retarded by the cooling of the fluid in its progress along the pipes, such cooling having a tendency to produce a double current ; and 4th, by bends and changes of form.

6. It will be evident to any person of philosophical research, however, that in considering water the only liquid capable of being employed, we should be losing sight of one of the greatest advantages resulting from the knowledge of natural phenomena, for all liquids expand by heat ; and hence, in all of them its partial application would produce motion under proper circumstances ; while the boiling points

Fig. 1.

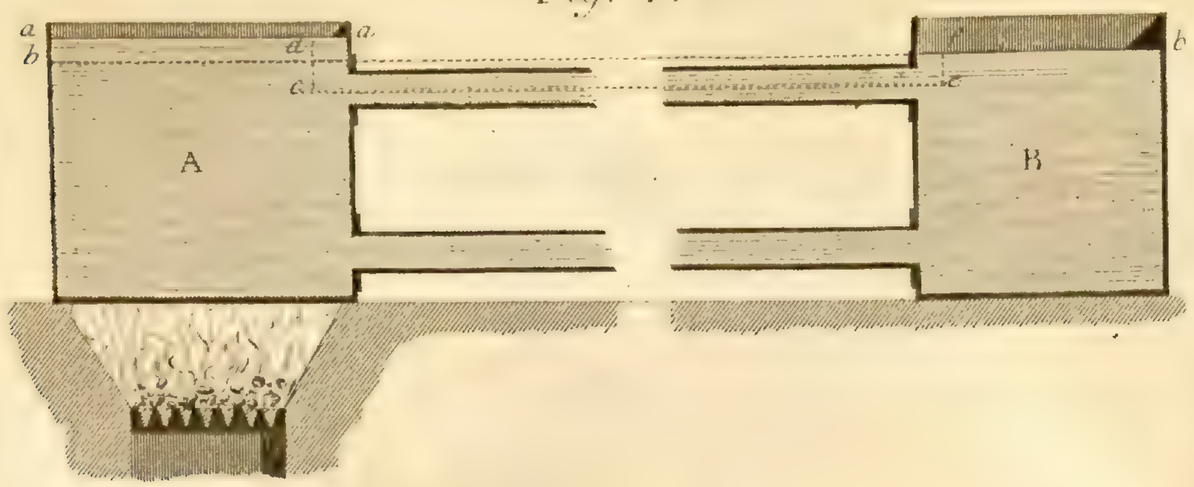


Fig. 4.

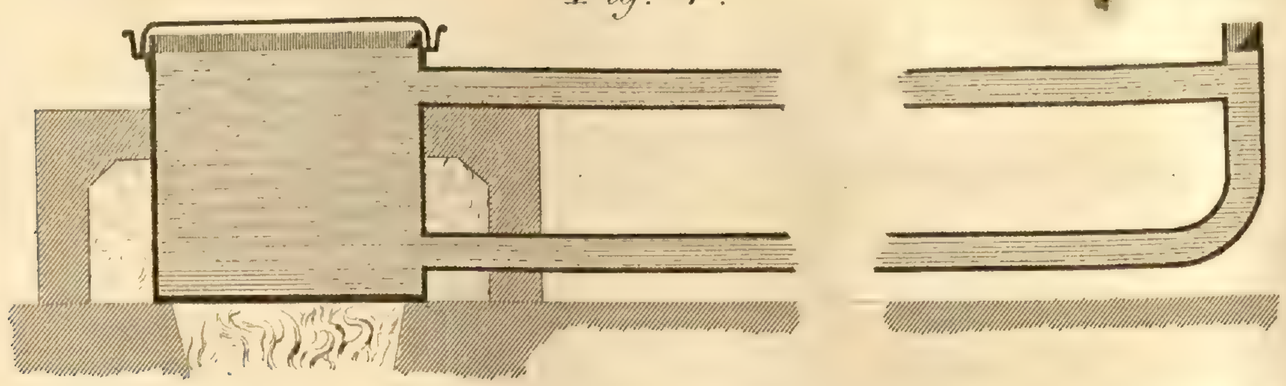
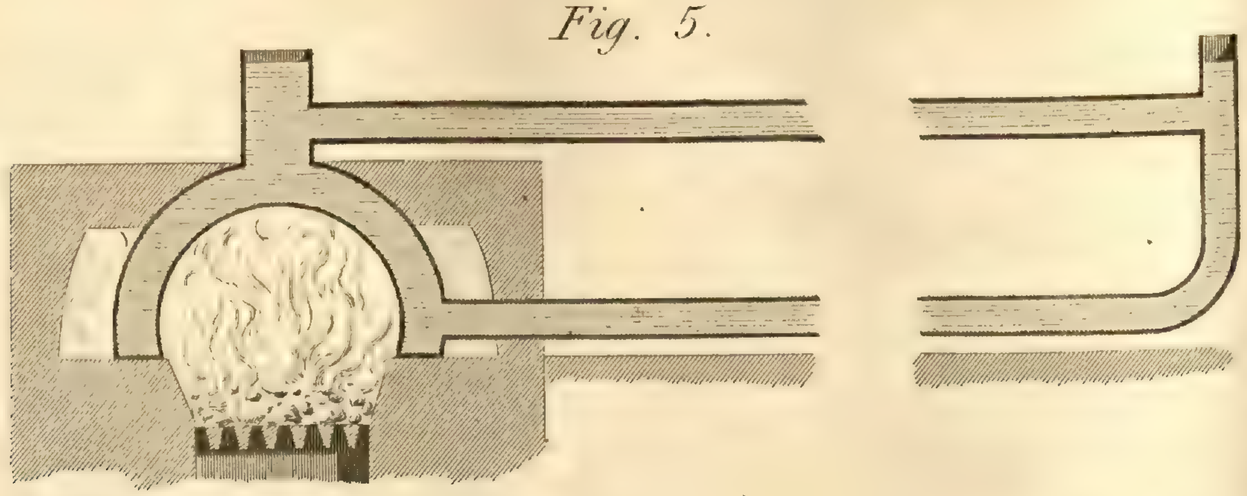


Fig. 5.



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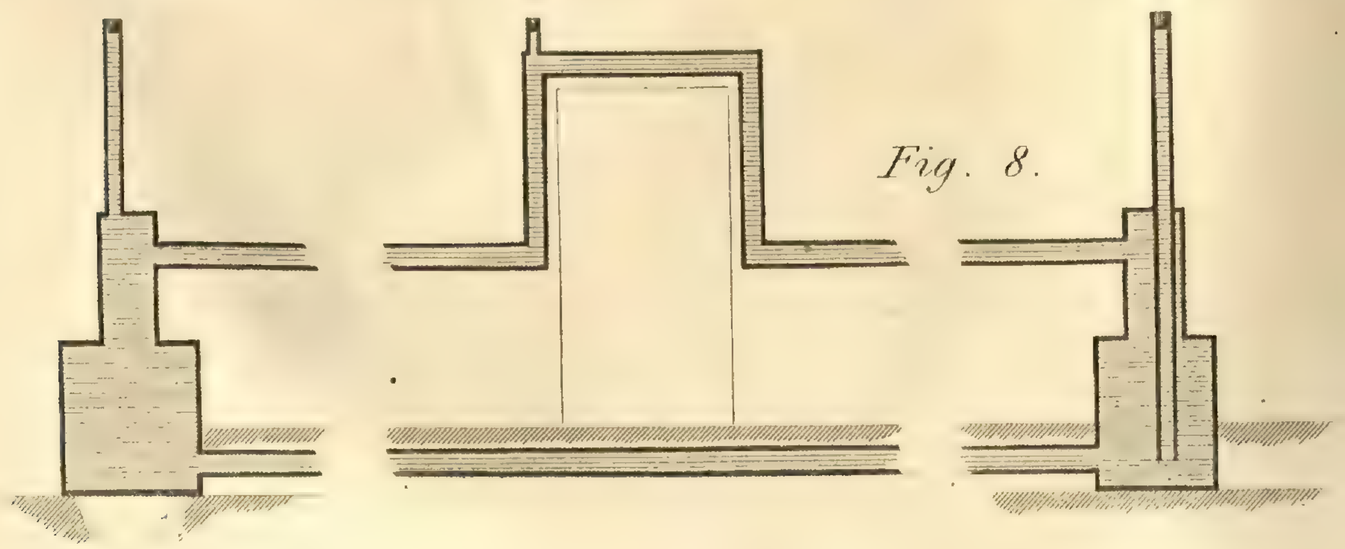

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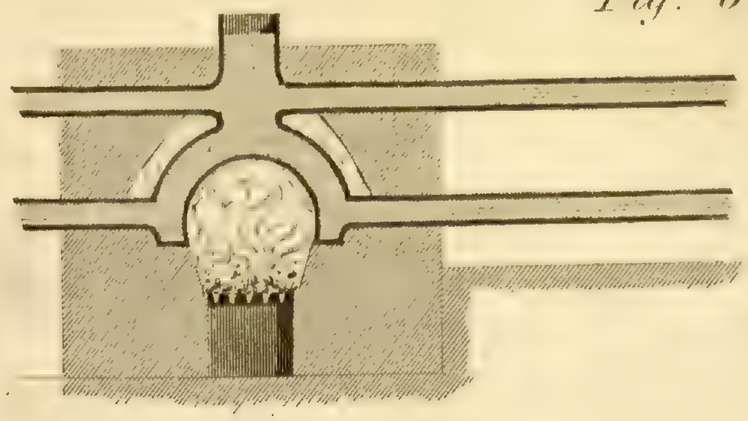


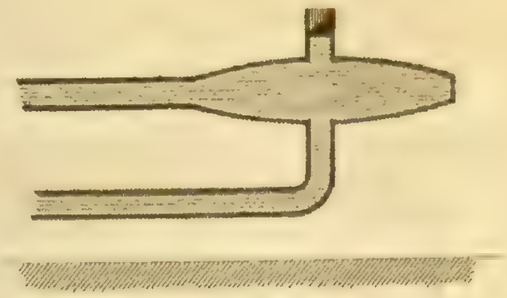
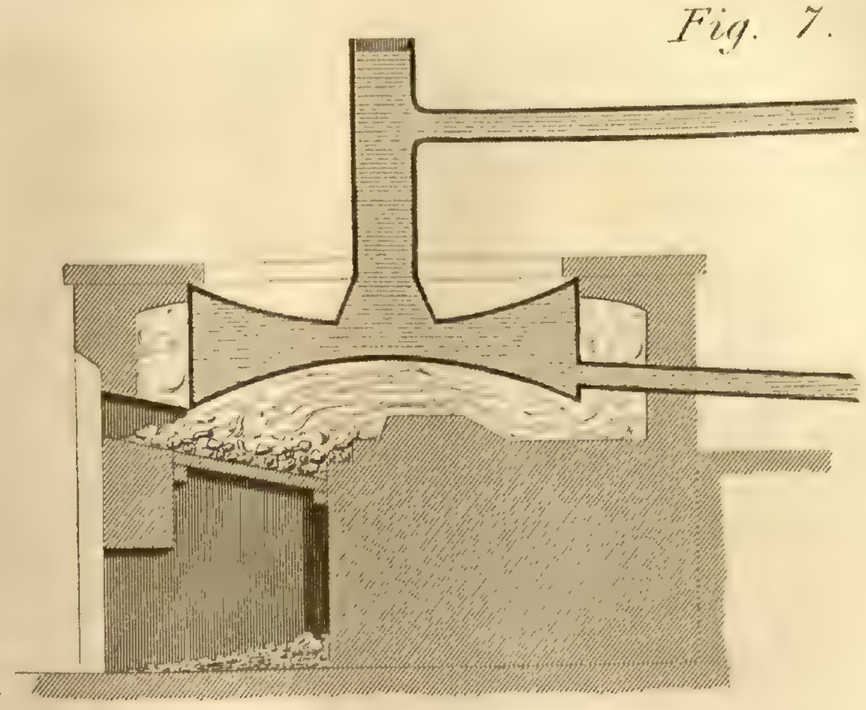


Fig. 7.



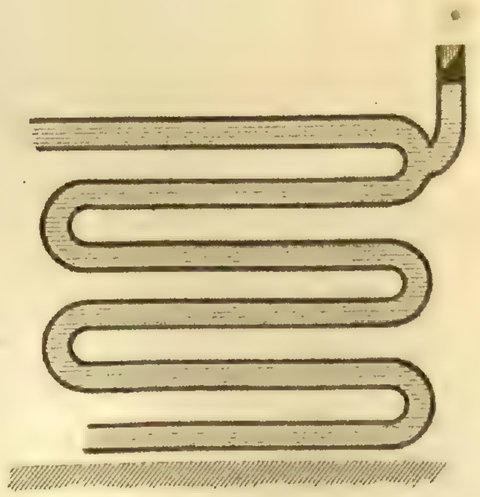


Fig. 9.

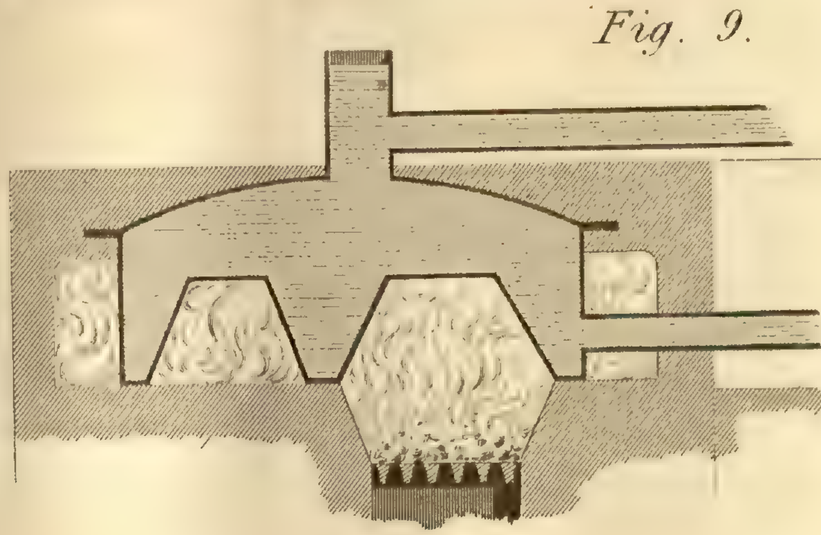


Fig. 3.

Fig. 2.

Figures to Illustrate the Methods of Heating by Hot-Water.

T. Tredgold delin.

J.W. Lowry sculp.

of different liquids are at such different temperatures that we may vary the ultimate temperature of the heating surface from 100 to 600 degrees, that of water being 212°. This mode of considering the subject opens a new source for speculation and for improvement, which it will be desirable to consider more in detail after analyzing the laws of the motion of liquids by heat.

7. A general investigation, embracing all the circumstances concerned in the motion, would be extremely intricate, and hence I shall not attempt to include more than those which are of sufficient importance to have an influence on the results requiring attention in practice; and, for a like reason I adopt the most simple formula of hydraulics that apply to the case.

Put l = the sum of the lengths of the pipes in feet.

h = the depth of the liquid in the boiler in feet below the centre of the upper pipe.

e = the expansion due to the mean difference of temperature at the extremes of the apparatus.

f = the friction of the liquid against the surface at the mean temperature for one foot in length and one inch in diameter.

d = the diameter of the pipe in inches; and,

v = the velocity in feet per second.

The friction of a pipe is as its surface, and the square of the velocity directly; and, the equivalent head is inversely as the area of the section of the pipe, consequently,

$\frac{3{\cdot}1416\, d\, l\, f\, v^2}{{\cdot}7854\, d^2.} = \frac{4\, l\, f\, v^2}{d}$ = the head equivalent to the friction.

But, in a pipe near the top, the head producing the velocity and overcoming the friction, is the quantity the fluid rises by expansion or $h\,e$; therefore,

$$\mathrm{A}\left(h\,e - \frac{4\,l\,f\,v^2}{d}\right) = v^2\text{; whence } \sqrt{\frac{\mathrm{A}\,h\,e\,d}{d + 4\,\mathrm{A}\,l\,f}} = v.$$

The effect of the cohesion of the fluid does not produce a sensible effect in practical cases; but, if it had been considered, the result would have shown that the pipe might be so small in proportion to its length as to render the velocity nothing.

8. The coefficients to be obtained from experiment are denoted by A, e, and f. That denoted by A depends only on the form of the tube or pipe at its junction to the boiler, being the same for all fluids.

For the common mode of joining (fig. 2) it is $\mathrm{A} = 42$; but, for a pipe with a conical entrance (fig. 3) it is $\mathrm{A} = 62$. Now the expence of the conical form renders it probable that it will seldom be used; hence, 42 may be inserted in any rule for general purposes.

9. The expansion of liquids not being perfectly equable by equal increments of temperature, and not the same for all liquids, the easiest mode for obtaining it for any particular case will be by means of a Table.

*Table of Expansion of Liquids.**

Expansion by one degree of heat at the temperatures in the first column.

Temperature.	Water.	Water saturated with common Salt.	Spirit of Wine.	Olive Oil,
▫				
62	·00009	·00010	·00059	
72	·00014	·00015	·00061	
82	·00017	·00018	·00063	
92	·00021	·00023	·00065	
102	·00025	·00027	·00068	·0007
122	·00029	00031	·00075	
142	·00031	·00034	·00077	
162	·00034	·00037	·00081	
172	·00035	·00038	·00083	
182	·00036	·00039		
202	·00037	·00040		
212	·00038	·00041		

If the difference of temperature for example be 8 degrees, and the mean temperature 172°, then, for water, $8 \times ·00035 = ·0028$ is the expansion of water by 8 degrees of heat, and $8 \times ·00038 = ·00304$ is the expansion for a saturated solution of salt.

10. The friction of fluids, and particularly the effect of change of temperature, has been investigated only in a very partial manner, the following Table is collected from the experiments of DUBUAT.†

* For water and spirit of wine from Dr. YOUNG's Nat. Phil. Vol. II. p. 392. Water saturated by salt from comparative trials at two points in the range.

† Principes d'Hydraulique, tome II. p. 13.

Experiments on the Motion of Liquids in Tubes of Glass at different Temperatures.

Liquids.	Degrees of heat by Fahrenheit's scale.	Head producing the motion in inches.	Velocity in inches per second.	Value of f from Experiment.
Horizontal Tubes ·0178 inches in diameter, and length 38·5 in.				
Rain Water . .	64°	9·45	27·0	·00183
Ditto	99½	16·3	38·2	·001537
Ditto	113	16·3	39·3	·00143
Ditto	158	16·3	39·9	·00139
Spirit of Wine .	58½	5·6	13·8	·00417
Ditto	58½	9·45	21·3	·00317
Horizontal tube 0 257 inches diameter, and length 38·5.				
Rain Water . .	39°	2·2	14·4	·00207
Ditto	53	2·2	15·2	·00183
Salt Water . .	39	2·2	13·6	·0024
Ditto	56	2·2	13·8	·00231 }
			mean	·00198 }
Ditto	54½ to 56½	5·2	24·8	·00165 }
Spirit of Wine .	58½	5·3	19·9	·00294

Classing these results we have

Temperature.	Value of Friction.		
	Rain Water.	Salt Water.	Spirit of Wine.
39°	·00207	·0024	
53 } 64 }	·00183	·00198	·00342
99½	·001537		
113	·00143		
158	·00139		

From whence it appears that for the usual temperature of

common water, in its effective state for affording heat, we may take ·0014 for the value of f; and, ·0015 for salt water, not very different from sea water.

11. By inserting those values for f in the formulæ, and 42 for A, we have for common water,

$\sqrt{\frac{\mathrm{A}\,h\,e\,d}{d + 4\cdot \mathrm{A} f l}} = \sqrt{\frac{42\,h\,e\,d}{d + \cdot 235\,l.}} = v$; and for sea water $\sqrt{\frac{42\,h\,e\,d}{d + \frac{1}{4}\,l}} = v$.

In these h is the depth of the boiler below the centre of the upper pipe in feet; l the length of pipe the liquid has to move through in its course from the boiler and back again; d the diameter of the pipe in inches; e the expansion of an unit in mass of the fluid by the difference of the mean temperatures of the boiler and reservoir; and v the velocity in feet per second; whence the quantity of fluid cooled, and, consequently, the quantity of heat afforded by the apparatus is known.

12. From the common principles of hydrostatics and the equations we have obtained, the following practical deductions may be derived.

1st. The more expansible the liquid is by a given change of temperature the greater will be the velocity.

2d. All other things being the same, the velocity will be increased in proportion to the square root of the depth of the boiler; therefore, in a boiler four times as deep, the velocity will be doubled.

3d. If there be sufficient service of pipe for the object required, a reservoir is not necessary to the motion of the water; a simple bent pipe (fig. 4) being all that is essential to motion; the reservoir is only to reserve a hot mass of water to maintain the heat after the fire has gone out.

4th. If a boiler have sufficient surface to receive the effect of the fire, and the whole apparatus contains as much water as will convey the heat from the fire to the heating surface in the time corresponding to its velocity, its capacity need not be further increased, except as a reservoir of heat, to act when the fire ceases to burn. Fig. 5.

5thly. Where heat is required only during the action of the fire, a large surface in proportion to its capacity may be used with advantage to give off heat over the descending pipe, fig. 6 and fig. 7; cooling in this manner will increase the velocity.

6thly. The aperture of the upper pipe should not be more than about an inch below the surface of the water, or as much as prevents its drawing air, in an open boiler, but the lower it is below that the less effect will be obtained; the lower pipe should enter the boiler where it has least tendency to cool, and check the fluid rising to the upper pipe from the fire surface.

7thly. In a close boiler a pipe may, at any distance from the boiler, rise to any height and descend again; but, it must neither rise twice, nor dip after leaving the boiler; where it is necessary to raise it, there should be an open pipe inserted at each extremity of the height of the rise; advantage has been taken of this circumstance to avoid doorways, fig. 8.

8thly. A certain quantity of motion would be obtained by a single horizontal pipe between any points except the bottoms of the vessels; but, the nearer to the surface the more motion will be obtained; and, with one pipe, there must be a double current in it.

9thly. The retarding effect of friction is directly as the

length, and inversely as the diameter of the pipes; it is also increased by every bend and angle in the pipes.

13. Having considered the circumstances necessary to the motion of the fluid in pipes, the next inquiry must be the quantity of heat a liquid can convey in a given time; and the quantity of surface required to communicate it to the air of the house. It is a fact, not so generally known as it ought to be, that if we communicate a certain quantity of heat to a liquid it will give out exactly the same quantity again in cooling to its former temperature; less nor more it cannot afford. It is equally true that, with the same temperatures, equal and like surfaces give off equal quantities of heat to air, &c.; and, consequently, the quantities of heat exchanged under given circumstances are measurable quantities, and this subtile element is brought within the domain of science.*

14. I have shown how to estimate the quantity of heat required for a Forcing-house, in my book on Warming and Ventilating (Art. 70 and 71) and, have since had to assign the proportions for houses of the largest size, and the most different from the ordinary forms of any in this country, which having stood the test of experience, and being far beyond the bounds of common practice, afford a proof of the benefit of studying first principles in new and untried cases; but, in general, for Hot-houses, twice the number of feet contained in the area of the surface of glass, will be equal to the number of cubic feet of air which that surface should heat per minute when in full action.

* Sir ISAAC NEWTON first established the laws of heating and cooling, in the Phil. Trans. for 1701.

15. Now the heat given off by the surfaces of the apparatus depends on the kind of materials they consist of, and their temperatures. The following Table shows the boiling point and temperature of the heating surface for different liquids when confined by iron or glass; also their specific heat, or that quantity of heat they can convey when that conveyed by an equal volume of water is unity.

Kind of Liquid.	Specific Heat.	Boiling Point.	Greatest Temperature of Surface.	Average Temperature.
		°	°	°
Water	1	212	190	180
Sea Water	. . .	214	192	182
Brine	. . .	226	205	192
Water 48, Alum 52	. . .	220	200	188
——— 55, Sulphate of lime 45	. . .	220	200	188
Petroleum	·415	316	285	245
Linseed Oil	·496	600	540	510
Sulphuric Acid	·35	605	544	514

16. If the cubic feet of air to be heated per minute be multiplied by the number of degrees it is to be warmed, and the result be divided by twice the difference between the temperature of the house, and that of the surface of the pipes, the result will be the feet of surface of iron pipe, &c. required. Thus, if 1000 cubic feet per minute are to be warmed, and the extreme case is supposed to be that when the external air is 20°, the house should be 50°; and, therefore, the air is to be warmed 30°; and with water the surface will be 190° when the water boils,* but only 180° in the average state, therefore,

$$\frac{1000 \times 30}{2\,(180 - 50)} = \frac{30000}{260} = 116 \text{ feet of surface.}$$

* The mean and extreme temperatures for the neighbourhood of London may be obtained from the observations of Mr. Daniell, in his Meteorological Essays.

If we employ brine for the same case;

$$\text{then, } \frac{1000 \times 30}{2\,(192-50)} = 106 \text{ feet.}$$

And, with oil,

$$\frac{1000 \times 30}{2\,(510-50)} = 32\tfrac{1}{2} \text{ feet would answer the purpose.}$$

When bright tinned iron, earthen-ware, &c. are employed for pipes, much more surface is necessary.

The advantage of using a fluid which bears a high temperature without boiling is therefore considerable in reducing the quantity of surface required to produce a given effect; oil requiring only one-third of the surface necessary for water; but oil is very inflammable, and sulphuric acid corrosive.

17. It is known from experience that the heat which raises the temperature of one cubic foot of water one degree will heat 2850 cubic feet of air one degree; consequently, if A be the quantity of air to be heated per minute to t degrees, and, x be the difference of the temperature of water in the apparatus, then

$\frac{A\,t}{2850} = wx$; or, $\frac{A\,t}{2850\,x} = w =$ the quantity of water in cubic feet that must flow along the pipe per minute to supply the heat; and, having shown (Art. 11) how to calculate the velocity; and the quantity being equal to the velocity per minute multiplied by the area of the pipe; the means of knowing whether the pipes be capable of allowing the proper quantity to flow along, or not, becomes easy; as well as of fixing the proper diameter. If any other liquor be used the number 2850 should be multiplied by the specific heat of that liquib; and then proceed as before.

18. The least quantity of liquid the apparatus could

contain, is double the quantity cooled during the time of making one circuit in the pipes, which is found by dividing the quantity *w*, as found above, by the number of circuits, or parts of a circuit made in a minute, and comparing the velocity with the length of the pipes. Whatever the quantity is in excess above, this is to be considered a reserve of hot fluid to afford heat after the fire is out; and, the fire must be so much earlier lighted as to heat this excess of water; as it must be hot before the surface can afford its effective supply of heat. Hence, there is a considerable objection among gardeners to large boilers, and large reservoirs.

19. But the most important of the properties of the hot water method, as first tried, consists in the power it has of keeping up the temperature of the house for a long period without attention from the attendant; and, it is entirely owing to the excess of fluid that it has this advantage over steam heat; and the exact knowledge which we now have of the heat which water contains in proportion to its temperature, enables us to calculate the time the cooling of the fluid will maintain the heat of a house; for if *u* be the number of degrees, the water is above the temperature of the house, and *w* its quantity in cubic feet; then since $\frac{\mathrm{A}\,t}{2850}$ is the quantity to supply the house one minute, $\frac{2850\,\mathrm{W}\,u}{\mathrm{A}\,t} =$ the minutes the temperature of the house will be sustained by the cooling of the water longer than in a house heated by steam alone. It will be obvious, the actual time of cooling will be more than twice this time, and the heat afforded to the house will decrease, but this is in some measure compensated for by the solid parts of the house receiving an excess while the apparatus is

in full action, or boiling, and which it affords again as the house cools; a compensation taking place in this manner, which renders it easy enough to proportion the quantity of reservoir with as much certainty as is necessary.

20. The ordinary method of making reservoirs and boilers so large as to answer the purpose of maintaining the heat during the night, has the objection already noticed of rendering it a considerable time before the apparatus can be raised to a temperature capable of giving much heat; and it appears to me that it would be a material improvement to heat the water for a reserve of heat, by passing the pipes of the apparatus through the water so that its temperature should be slowly raised, and the house receive heat during the time. A small proportion of surface of pipe will heat the water, because, water abstracts heat from a heating surface with about twenty times the rapidity that air does at the same temperatures; hence, by putting a twentieth part, in addition to the surface required for the house, through a proper reservoir of water it will be slowly raised to nearly the same temperature as the water in the pipes, and return its heat to the house as soon as the fire ceases to keep up an excess of heat in the pipes. Fig. 9, shows such an arrangement where *c* is the cistern with part of the pipe passing through it.

21. There is very little strain on the boilers of hot water apparatus, except in cases where there is much difference of level; and, as these rarely occur, consequently they may be constructed in the best mode for applying heat; which is most effectively done by having as much bottom surface as possible with a boiler of a given capacity. For burning a bushel of coals per hour, the area of the fire grate should not

be less than eight, nor greater than sixteen square feet, and the bottom surface four times the area of the grate, with thirty-two feet of side flue; and a considerable advantage results from adopting the larger proportion for the grate and bottom surface, on account of the fire requiring less attention.

22. The forms of boilers may be varied in a considerable degree, provided the above quantity of surface receives the effect of the fire; the first kind used by Mr. Atkinson, was a parallelepiped with the fire applied to the base only. I have employed the same form, but of greater length in respect to its width, hence of less capacity, and made the flue go round the sides of the boiler; it is then of great length, and very effective, and this I consider the best and most simple plan for an open topped boiler, serving as a partial reservoir of heat. A boiler in the form of half a hollow cylinder, affording a great quantity of fire and flue surface, is made by Messrs. Bailey, (fig. 5) and a bottle-shaped boiler (fig. 6) is made by Messrs. Cottam and Hallen, which has a considerable quantity of fire and flue surface, compared with its capacity; both these are, therefore, well adapted to cases where only a small reserve of heat is required for night. The variation of the Scotch distiller's boiler, (fig. 7) is also a good form for maintaining the supply of heat to the house, while a separate reservoir is warmed by part of the pipes. Another mode of obtaining a large portion of fire and flue surface to a small capacity, is shown in (fig. 9,) but complicated forms have little to recommend them, and are expensive except when so small as to be cast in iron, because the fire should be partially surrounded by slow conductors of heat to prevent the dissipation of heat being too rapid, and to render the

combustion of the fuel perfect, and, consequently effective; hence, a fire-place surrounded on three sides by brick, is better than one in the middle of the boiler.

23. The best mode of regulating the fire, is by means of a door to the ash-pit, having a register, first suggested by Dr. BLACK, and afterwards put in practice by Count RUMFORD.

24. I have now considered the most important points in the construction of a hot-water apparatus, and have shown that other fluids may be applied as well as water, when a more intense heating surface is desirable; and that a reservoir of heat may be obtained without having to wait till a large mass of water be heated before the heat has any effect on the house; and these I hope will be of some use in the application of this method of distributing heat.

I have the honour to be,

Sir, your most obedient servant,

To Joseph Sabine, Esq.

THOMAS TREDGOLD.

LVIII. *On the Degeneracy of the larger and finer Varieties of Persian Melons, in the climate of England.* By Thomas Andrew Knight, *Esq. F. R. S. &c. President.*

Read November 3, 1829.

It is a generally received, and I believe a well founded opinion, that those varieties of Melons, which have long been cultivated in the climate of England, of which the rind is hard and thick, and the flesh highly coloured, do not now degenerate; and those persons, who hold the merits of those varieties in the same degree of estimation that I do, will think with me, that they are tolerably safe from all danger of becoming much worse than they now usually are. They are, however, good enough for the purpose to which I see them usually applied, that of being looked at only; for out of a hundred pounds weight of such fruit, which I have seen laid upon the tables of my friends, within the last ten years, I am certain that not one pound has been eaten. Some of the green-fleshed varieties possess, it must be admitted, more merit; but all these, which I have seen, have been greatly inferior, both in taste and flavour, to the large Persian varieties, which have lately been introduced by this Society, and which had been imported at former periods, but had ceased to be cultivated, or known. The first kind which I saw (it was about thirty years ago) of these Persian varieties, was one of globular form, of an intensely bright colour, and perfectly white flesh. Its common weight was nearly eight pounds, and its

taste and flavour, and the consistence of its flesh, were most excellent; but I found it difficult to get its blossoms to set. Having spoken to Sir Joseph Banks of its excellence, he told me that he had received seeds at different periods of his life of many of such large and excellent varieties of melons; but that he had found every variety soon to lose its good qualities, and that I should not be able to preserve those of the variety in praise of which I had been speaking. I did not, at that period, believe his opinions to be well founded; and I suspected that his Melons had lost their good qualities by intermarriages with inferior varieties; but I have since had ample reasons for believing that his opinions were perfectly well founded, for my fruit became less in bulk and weight, and deteriorated in taste and flavour.

I have subsequently cultivated another somewhat similar variety, with the same ill success, my plants setting their blossoms more and more freely as the good qualities of the fruit gradually disappeared; and I now think that it would be strange if every large and excellent variety of Melon did not degenerate under our ordinary modes of culture. For every large and excellent variety of Melon must necessarily have been the production of high culture, and abundant food; and a continuance of the same measures, which raised it to its highly improved state, must be necessary to prevent its receding in successive generations from that state.

Abundant food, it is true, is generally, perhaps always, given by the British gardener to his Melon Plants; but sufficient light, under the most favourable circumstances, can only be obtained during a part of the year; and a sufficient breadth of foliage to enable the Melon plant properly to nourish a

fruit of large size, and rich saccharine quality, so that it may attain the highest state of growth and perfection, which it is capable of acquiring, has rarely, and probably never, been given, in any season of the year, by any British gardener.

I received about ten years ago, from Sir HARFORD JONES BRIDGES, better known to the public as Sir HARFORD JONES, some seeds of the Melon, which has been named in our Transactions, the Sweet Ispahan Melon, and which he obtained from Persia. Having found it to be a very excellent variety, equal, and indeed superior, to any which I had before possessed or seen, I took measures, which I think have proved perfectly successful, to cause it to retain its size undiminished, and its flavour unimpaired: and I have, to make the experiment fairly, generally sowed in each year some of the seeds which I obtained in the preceding year; unless I failed to succeed in obtaining those under favourable circumstances, and in a proper state. The taste and flavour of the fruit under the mode of culture, which I have adopted, and which I shall proceed to describe, appear to me to be now quite as perfect as when the variety first came into my possession; and the weight of the largest fruit I obtained in the last season, exceeded by more than two pounds the weight of the largest, which I raised under the same mode of culture from the seeds first put into my possession, it having weighed ten pounds six ounces.

I have cultivated this variety generally in a brick-pit surrounded by hollow walls, through which warm atmospheric air at all times enters abundantly; and of which a description and plate have been given in our Transactions, putting each plant in a separate large pot, and suffering it to bear one

Melon only. But the fruits set and succeed sufficiently well in a common hot-bed; and the important point, to which I wish to draw the attention of the gardener, is the weight of fruit which any given extent of glass roof is capable of producing in high perfection. I have found that thirteen inches square of glass roof will afford me a pound of excellent fruit; but I sometimes obtain more: though whenever I wish to save seeds, my wishes are to have rather less. This quantity will probably appear small to many who are in the habit of cultivating some other varieties: but if the roof of a vinery were seen with a bunch of Grapes of a pound weight, at thirteen inches distance from each other over the whole extent of its roof, the crop would be thought extremely great; though the vine has always the advantage of having its roots and stems, and leaves and blossoms, prepared in the preceding year, whilst the Melon plant has every thing to do within the space of three or four months.

The rind of the Ispahan, as of other Persian Melons, being very soft and thin, the fruit is apt to sustain injury upon its under side, if it be not properly supported; and I, therefore, when I raise any of those varieties in a hot-bed, always place the fruit, whilst very young, upon a little machine in the form of a short broad ladder, of a foot long, and four inches wide. This, which has four slender cross bars, is supported at its corners by four forked pegs, which are stuck into the mould of the bed; and the fruit is thus raised some inches above the surface of the mould of the bed, and exposed to light, whilst the air is permitted to pass freely under it. I send a few seeds of the large Melon above mentioned, with the hope that some other Members of our Society will succeed as well

in cultivating the variety as I have done, and that they will find it, as I have done, superior in merit to any of those which have subsequently been imported from Persia.

Whenever it is my wish to obtain seeds of the Ispahan Melon, I do not sow its seeds earlier than the middle of April, that my plants may grow and blossom in June, during the brightest weather of our climate, and ripen their fruit early in August.

I have some reasons for believing that very valuable varieties of the Melon may be obtained, for one generation at least, by cross breeding between the smaller and more hardy varieties of green and white fleshed Melons, and the large Persian varieties. I obtained from one of our Members, Captain Rainier, R. N. (to whom our gardens are indebted for some other valuable articles) a Melon of a very singular character, from the seeds of which, and the pollen of the Ispahan Melon, I obtained plants of more hardy and productive habits than those of the Ispahan Melon, and which afforded fruit scarcely, if at all, inferior to that. The colour of the above-mentioned, which I received from Captain Rainier, is pale green, with longitudinal stripes of very deep green; and being very long and slender whilst young, it excited in the minds of several persons, when they first saw it, the idea of a snake lying amongst the leaves of the plant. During the growth of the fruit the pale green part of it acquires a very bright yellow colour, and this, as the fruit approaches maturity, slowly fades into the colour of box-wood. Its flesh being green and of good quality, though inferior in richness to that of the Ispahan, and the plants extremely productive of fruit, I introduced the pollen of the Ispahan Melon into its

blossoms with very beneficial effects upon the offspring. In the last season I again introduced the pollen of the Ispahan Melon into the blossoms of the cross bred varieties, and from the seeds thus obtained, of which I send a small number, I confidently expect fruit of very great excellence. It is, I believe, very generally supposed, that the offspring of cross bred plants, as well as of cross bred animals, usually present great irregularity and variety of character: but if a male of permanent habits, and of course not cross bred, be selected, that will completely overrule the disposition to sport irregularly in the cross bred variety alike in the animal and vegetable world, the permanent habit always controlling and prevailing over the variable. The finest varieties of Melons are usually supposed by gardeners to be comparatively with the Pine Apple, fruits of easy culture: but experience has led me to draw a contrary conclusion, and to believe that more skill, and still more trouble and attention, are requisite, in almost all seasons, to ensure a crop of Melons in the highest state of perfection which that fruit is capable of acquiring. If the leaves of a Melon plant be suddenly exposed to the influence of the sun in a bright day, which has succeeded a few cloudy days, for a short time only, they frequently become irreparably injured. If the air of the bed be kept a little too damp, the stems of the plants often canker, and the leaves and stalks sustain injury in the common hot-bed; and if the air be too dry the plants, and consequently the fruit, are injured by the depredations of the red spider. The Pine Apple, on the contrary, I have found, (as I have stated in former Communications) to be a plant of very easy culture; and I much doubt whether any Pine-stove in the kingdom at the present moment contains as

fine plants at the same age, and confined within the same limits, as my houses contain, and I am quite certain that the time and trouble expended in the care of these is not one fourth part as much as an equal extent of Melon-beds would have required during any given period of the growth of the Pine Apple plants.

NOTE. The Title-page, Index, &c. of the Seventh Volume will be published speedily.

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List of MEDALS *presented by* ORDER *of the* COUNCIL *of the* HORTICULTURAL SOCIETY *of* LONDON, *from May* 1, 1828, *to May* 1, 1830.

To MR. ALEXANDER CAMPBELL, Gardener to the Comte de Vandes, for his skill in the cultivation of Stove plants, and particularly of Combretum comosum, which had not flowered in any other collection.

To WILLIAM THOMAS SALVIN, Esq. F. H. S. for his cultivation of Grapes on flued walls at Crossdale, Durham.

List of PERSONS *to whom the* BANKSIAN MEDAL *has been presented by* ORDER *of the* COUNCIL *of the* HORTICULTURAL SOCIETY *of* LONDON, *for* EXHIBITIONS *at* GENERAL MEETINGS *of the* SOCIETY, *from May* 1, 1828, *to May* 1, 1830.

To Mr. CHARLES MARSHALL, Gardener to THOMAS LANGLEY, Esq. F. H. S. for his Specimens of seedling perennial Lupines, exhibited on the 3rd of June, 1828.

To Mr. HENRY GROOM, F. H. S. for his flowers of Ranunculuses, exhibited on the 5th of August, 1828.

To Mr. THOMAS BAILEY, Gardener to EDWARD BOUVERIE, Esq. of Delapre Abbey, for his green-fleshed Melon, exhibited on the 5th of August, 1828.

To Mr. THOMAS FAIRBAIRN, for flowers of Renanthera coccinea, exhibited on the 16th of September, 1828.

To Mr. WILLIAM SQUIBBS, Gardener to CHARLES HAMPDEN TURNER, Esq. F. H. S. for flowers of Double Dahlias, exhibited on the 7th of October, 1828.

To WILLIAM CATTLEY, Esq. F. H. S. for his flowers of Cattleya labiata, exhibited on the 4th of November, 1828.

To the Rev. JAMES ARMITAGE RHODES, for Grapes and Pine Apples, exhibited on the 4th of November, 1828.

To Mr. ALEXANDER CAMPBELL, Gardener to the COMTE DE VANDES, for his plant of Cactus truncatus in flower, exhibited on the 18th of November, 1828.

To Mr. HENRY BURN, F. H. S. for his Black Jamaica Pine Apple, exhibited on the 18th of November, 1828.

To CHRISTOPHER RICHARD NUGENT, Esq. C. M. H. S. for his Cone of the Araucaria Dombeyi, exhibited on the 3rd of February, 1829.

To Mr. Joseph Wells, Gardener to William Wells Esq. F. H. S. for his flowers of a new Chinese Yellow Azalea, exhibited on the 7th of April, 1829.

To Mr. William Robert Grayson, for Asparagus, exhibited on the 19th of May, 1829.

To John Reeves, Esq. F. H. S. for dried fruit of Diospyrus Kaki, exhibited on the 7th of July, 1829.

To Mr. John Lee, F. H. S. for a collection of Roses, exhibited on the 7th of July, 1829.

To Mr. Benjamin Fielder, Gardener to Mr. William Linwood, F. H. S. for a seedling Grape, exhibited on the 4th of August, 1829.

To Mr. Charles Spong, C. M. H. S. for a Queen Pine Apple, exhibited on the 4th of August, 1829.

To Mr. Joseph Gundry, Gardener to Samuel Paynter, Esq. F. H. S. for a Cockscomb, exhibited on the 15th of September, 1829.

To Mr. William Greenshields, F. H. S. for a Queen Pine Apple, exhibited on the 15th of September, 1829.

To John Williams, Esq. C. M. H. S. for a seedling Grape, exhibited on the 6th of October, 1829.

To Mr. William Hughes, C. M. H. S. for Grapes, exhibited on the 20th of October, 1829.

List of MEDALS *awarded at the* ANNIVERSARY MEETING *of the* HORTICULTURAL SOCIETY *of* LONDON *in the year* 1828.

LARGE SILVER MEDALS.

To Mr. THOMAS CLUES, Gardener to C. C. HARTOPP, Esq. for Grapes.

To Mr. WILLIAM DOLBY, Gardener to JOSIAH JOHN GUEST, Esq. F. H. S. for a Providence Pine Apple.

BANKSIAN MEDALS.

To Mr. JOHN LUCK, Gardener to PHILIP DAVIES COOKE, Esq. F. H. S. for Peaches and a Providence Pine Apple.

To Mr. GEORGE WHITE, Gardener to BENJAMIN BENYON, Esq. F. H. S. for Grapes.

To Mr. JOHN OWEN, Gardener to CHARLES GOMOND COOKE, Esq. F. H. S. for a Providence Pine Apple.

To Mr. THOMAS TYER, Gardener to the Lord ELLENBOROUGH, F. H. S. for Strawberries.

To Mr. THOMAS TORBRON, Gardener to the Earl of ABERDEEN, F. H. S. for Peaches.

To MICHAEL MUCKLOW ZACHARY, Esq. F. H. S. for a Melon.

List of MEDALS *awarded at the* ANNIVERSARY MEETING *of the* HORTICULTURAL SOCIETY *of* LONDON *in the year* 1829.

LARGE SILVER MEDALS.

To Mr. ROBERT GUNTER, for Grapes and a Pine Apple.

To Mr. JOSEPH PAXTON, Gardener to the Duke of DEVONSHIRE, F. H. S. at Chatsworth, for various Fruits.

BANKSIAN MEDALS.

To Mr. THOMAS CLUES, Gardener to E. C. HARTOPP, Esq. of Four Oaks Hall, near Birmingham, for Grapes.

To Mr. WILLIAM DOLBY, Gardener to JOSIAH JOHN GUEST, Esq. F. H. S. for a Pine Apple.

To Mr. JOHN MEARNS, Gardener to WILLIAM HANBURY, Esq. of Shobden Court, Herefordshire, for Nectarines and Grapes.

To Mr. THOMAS TYER, Gardener to the Lord ELLENBOROUGH, at Roehampton, for Strawberries.

To Mr. JOHN MILLER, F. H. S. for Queen Pine Apples.

To the Lord RODNEY, F. H. S. for Melons.

To RICHARD JONES POWELL, Esq. of Hinton Court, Hereford, for a Melon.

To Mr. CHARLES MORRIS, of Brentford, for Cherries.

To Mr. WILLIAM ASHTON, of THORNE's House, near Leeds, for various Fruits.

To Mr. BENJAMIN LAW, of Northampton, for Grapes and Melons.

List of MEDALS *presented to* LOCAL HORTICULTURAL SOCIETIES *within the United Kingdom, for the year* 1828.

By the CALEDONIAN HORTICULTURAL SOCIETY, to Mr. JOHN HAY, of Edinburgh, Corresponding Member of the Horticultural Society of London, for his "Account of a Mode of producing bottom Heat for Pine-Apple Pits by means of Steam introduced into a close chamber filled with rounded or water-worn Stones," printed in the second part of the fourth volume of the Memoirs of the Caledonian Horticultural Society.

By the ABERDEENSHIRE HORTICULTURAL SOCIETY, to Mr. JOHN DAVISON, Gardener to The Lord KENNEDY, at Donnottar House, near Aberdeen, for having exhibited during the year 1828 the greatest number of superior fruits, flowers, and other Horticultural productions, as well as having received the greatest number of prizes awarded during the year.

By the CAMBRIDGESHIRE HORTICULTURAL SOCIETY, to Mr. SAMUEL WIDNALL, of Granchester, Nurseryman, for the excellency of his productions, and the number of prizes he obtained within the year; of these, sixteen were *first* prizes.

By the DUMFRIES AND GALLOWAY HORTICULTURAL SOCIETY, to Mr. JAMES CUNNINGHAM, Gardener to WILLIAM STOTHERT, Esq. of Cargen, in Kirkudbrightshire, for having gained in the course of the year 1828 the greatest number of prizes from the Society for the most useful and ornamental articles in cultivation, and for his general industry and ability as a gardener.

By the HORTICULTURAL SOCIETY OF DURHAM, NORTHUMBERLAND, AND NEWCASTLE-UPON-TYNE, to

Mr. Joseph Clarke, Gardener to Mr. Bewicke, of Close House, near Newcastle, for the greatest number of Medals gained during that year, as well as for the superiority of his exhibitions and communications, especially for a paper on the preservation of Apples.

By the VALE OF EVESHAM HORTICULTURAL SOCIETY, to Mr. George Fulton, Gardener to The Lord Northwick, of Northwick Park, in Worcestershire, for his general productions in Horticulture of superior excellence and flavour, and for his communications read to the Society.

By the GLASGOW HORTICULTURAL SOCIETY, to Mr. George Duncan, Gardener to Miss Oswald, of Scotstown, near Glasgow, he having in the unanimous opinion of the judges appointed by the Society, displayed most knowledge of his business, greatest industry, and altogether most merit in the cultivation of the Garden under his charge in comparison with the Gardens of other competitors, the judges having taken into consideration the assistance afforded to him, the circumstances of the Garden, the extent and variety of the articles produced, and all other matters affecting his management.

By the GLAMORGANSHIRE AND MONMOUTHSHIRE SOCIETY, to Mr. Peter Lauder, Nurseryman, for his communication on planting Orchards, which was published in the "Cambrian" newspaper on the 22d of August, 1829.

By the HEREFORDSHIRE HORTICULTURAL SOCIETY, to Mr. William Godsall, of Hereford, Florist, for having gained the greatest number of prizes during the year 1828, and for his inventions of a garden plough, and several ingenious and useful implements of gardening.

By the IPSWICH HORTICULTURAL SOCIETY, to Mr. Robert Milborn, of Ipswich, Market Gardener, for the general excellence of his productions (Fruits and Esculent Vegetables) exhibited at the different meetings of the Society in the year 1828.

By the ROSS HORTICULTURAL SOCIETY, to Mr. Charles Hilton, Gardener to Colonel James Kyrle Money, of Hom House, Herefordshire, for the many valuable seedling Cider and Perry fruits grown by him, for his skilful mode of forcing Grapes, and for the various fine specimens of fruit exhibited by him at the meetings of the Society.

By the WINCHESTER HORTICULTURAL SOCIETY, to Mr. William Stiles, Gardener to the Rev. Thomas Garnier, of Bishopstoke, for his production of a variety of fine fruits at the different meetings of the Society, for his general attention to the Garden under his care, and particularly for his management of the Flower Garden.

By the YORKSHIRE HORTICULTURAL SOCIETY, to Mr. Thomas Deuxberry, Gardener to the Rev. James Armitage Rhodes, of Horsforth Hall, near Leeds, for his excellence as a grower of Pines, Grapes, and fruits in general.

Medals presented to Local Horticultural Societies *within the United Kingdom, for the year* 1829.

By the CALEDONIAN HORTICULTURAL SOCIETY, to the Earl of Dunmore, for the unwearied and enlightened zeal with which he has for many years promoted the interests of Horticulture in Scotland, particularly in producing at Dunmore Park Garden, by crossing the breeds on scientific principles, the finest Seedling Pears ever raised in this country.

By the ROSS HORTICULTURAL SOCIETY, to Mr. Thomas Reynolds, Nurseryman and Gardener, Ross, for his practical skill in the science of Horticulture, and the zeal displayed by him at the establishment of the Society, and the support he has since given to it at twenty-five public exhibitions.

By the VALE OF EVESHAM HORTICULTURAL SOCIETY, to Mr. John Hunt, of Pershore, for his various fine specimens of fruit, particularly Strawberries, and other Horticultural productions exhibited by him at all the Meetings of the Society since its first establishment, as well as during the present year (1829), for which many prizes have been awarded, and for his great success in cultivating and raising on twenty-seven acres of orchard ground between three and four thousand Seedling Apples and Pears, and above eight hundred named grafted fruits of various sorts, many of which are new and of improved quality and flavour.

By the ABERDEENSHIRE HORTICULTURAL SOCIETY, to Mr. David Gairns, Gardener to James Mitchell Nicholson, Esq. of Glenbervie, for having gained in the course of that year at five of the six competitions held in Aberdeen, eleven prizes, for his exhibitions of Fruits, Flowers, and other Horticultural productions.

By the HEREFORDSHIRE HORTICULTURAL SOCIETY, to Mr. Thomas Gardner, Gardener to Sir J. G. Cotterell, Bart. for having gained the greatest number of Prizes during the year, and for the great merit he has evinced in the management of the Garden under his charge.

By the DUMFRIES HORTICULTURAL SOCIETY, to Mr. Alexander M'Gillivray, Gardener to C. G. S. Menteith, Esq. of Closeburn Hall, Dumfriesshire, for the variety and superior quality of the articles produced by him during the year, for his skill and ability as a Gardener, his uniform steady conduct, and with reference to his having been a regular and successful competitor for many years past.

By the CAMBRIDGESHIRE HORTICULTURAL SOCIETY, to William Searle, Esq. of Chesterton, for having gained the greatest number of Prizes during the year, the number being twenty-seven, of which three were Medals, and eighteen others *first* Prizes.

By the LIVERPOOL HORTICULTURAL SOCIETY, to Mr. Thomas Green, Gardener to Mr. Powell, of Breck Lodge, near Liverpool, for his productions principally of Exotics, Fruits, and Flowers.

By the IPSWICH HORTICULTURAL SOCIETY, to Mr. Timothy Sally, Gardener to C. Berners, Esq. of Holbrook, for the general excellence of his productions, (fruits and esculent vegetables) exhibited at the different Meetings of the Society in the year 1829.

By the MANCHESTER HORTICULTURAL SOCIETY, to J. C. Walker, Esq. of Longford, for his unremitting and indefatigable attention to Horticulture, which has greatly tended to promote the knowledge of the Science in the neighbourhood of Manchester, and which was confirmed by the specimens of fruit and vegetables exhibited by him on the opening of the Manchester Botanical and Horticultural Institution.

By the WINCHESTER HORTICULTURAL SOCIETY, to Mr. JOHN PITT, Gardener to G. R. G. RICHETTS, Esq. for his general good management of the Garden, particularly of his flowers.

By the HORTICULTURAL SOCIETY OF DURHAM, NORTHUMBERLAND, AND NEWCASTLE-UPON-TYNE, to Mr. JAMES SCOTT, Gardener to EDWARD CHARLTON, Esq. of Sandoe, near Hexham, not only for the numerous exhibitions for which prizes have been awarded to him, but also for his great attention to the interests of the Society and zeal in forwarding its objects.

By the DUNDEE HORTICULTURAL SOCIETY, to Mr. JAMES KIDD, Gardener to the Lord KINNAIRD, for having gained the greatest number of Prizes during the current season.

By the YORKSHIRE HORTICULTURAL SOCIETY, to Mr. THOMAS APPLEBY, Gardener to the Rev. J. A. RHODES, of Horsforth Hall, for having gained the greatest value of Prizes during the year.

LIST OF BOOKS AND OTHER ARTICLES,

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Acta Academiæ Scientiarum Imperialis Petropolitanæ. 6 vols. 4to. Petropoli, 1778-1786.

Commentarii Academiæ Scientiarum Imperialis Petropolitanæ. 14 vols. 4to. Petropoli, 1728-1751.

Nova Acta Academiæ Scientiarum Imperialis Petropolitanæ. 15 vols. 4to. Petropoli, 1787-1806.

Novi Commentarii Academiæ Scientiarum Imperialis Petropolitanæ. 20 vols. 4to. Petropoli, 1750-1776.

Mémoires de l'Académie Impériale des Sciences de St. Pétersbourg. 9 vols. 4to. St. Pétersbourg, 1809-1824.

Troodi Academii Naook. 2 vols. 4to. St. Petersburgh, 1823.

Oomozritelnaia Izsledovania Imperatorskavo Sanctpeterburgskoi Academii Naook. 5 vols. 4to. St. Petersburgh, 1810-1819.

HIS MAJESTY THE KING OF THE NETHERLANDS, F. H. S.

Flora Batava. Nos. 79 to 83 inclusive. 4to. Amsterdam, 1828-1830.

L'ACADÉMIE ROYALE DES SCIENCES DE L'INSTITUT DE FRANCE.

Mémoires de l'Académie. Vols. 7 and 8. 4to. Paris, 1827-1829.

AGRICULTURAL AND HORTICULTURAL SOCIETY OF INDIA.

Transactions of the Agricultural and Horticultural Society of India. Vol. 1. 8vo. Serampore, 1829.

AMERICAN PHILOSOPHICAL SOCIETY.

Transactions of the Society held at Philadelphia, New Series. Part 2. Vol. 3. 4to. Philadelphia, 1830.

SOCIETY OF ARTS.

Transactions of the Society of Arts. Vols. 46 and 47. 8vo. London, 1828-1829.

ASIATIC SOCIETY OF BENGAL.

Asiatic Researches. Vol. 16. 4to. Calcutta, 1828.

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Transactions of the Royal Asiatic Society. Part 1. Vol. 2. 4to. London, 1829.

BERLIN HORTICULTURAL SOCIETY.

Verhandlungen des Vereins zur Beförderung des Gartenbaues in den Königlich Preussischen Staaten. Vols. 1, 2, 3, 4, 5, and Part 1 of Vol. 6. 4to. Berlin, 1824-1829.

CAMBRIDGESHIRE HORTICULTURAL SOCIETY.

The Fourth Report of the Cambridgeshire Horticultural Society, read at the General Meeting on the 7th of March, 1828. 8vo. Cambridge, 1828.

The Fifth Report of the Cambridgeshire Horticultural Society, read at the General Meeting on the 6th of March, 1829. 8vo. Cambridge, 1829.

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Memoirs of the Caledonian Horticultural Society. Part 2 of Vol. 4, for 1829. 8vo. Edinburgh, 1829.

List of Prizes proposed by the Caledonian Horticultural Society for 1829. 8vo. Edinburgh, 1829.

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HORTICULTURAL SOCIETY OF DURHAM, NORTHUMBERLAND, AND NEWCASTLE ON TYNE.

Transactions of the Horticultural Society of Durham, Northumberland, and Newcastle on Tyne. Part 1. Vol. 1. 8vo. Newcastle, 1827.

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Catalogus Plantarum Horti Botanici Musei Imperialis et Regalis Florentini. 4to. Florence, 1827.

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Jungii Opuscula Botanico-Physica. 4to. Coburgi, 1749.

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Osbeck Iter. Ind. Orient. 8vo. Stockholm, 1757.

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Hasselquist's Iter Palæstinum. 8vo. Stockholm, 1757.

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Löflings Iter Hispanicum. 8vo. Stockholm, 1758.

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Blumenbachia, Novum e Loasearum familia Genus; adjectis observationibus super nonnullis aliis rarioribus aut minus cognitis Plantis. 4to. Göttingen, 1827.

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Annales de l'Institut Horticole de Fromont. Tom. 1. Partie 1 et 2. 8vo. Paris, 1829.

EARL STANHOPE, F. H. S.

Address of Earl Stanhope at the Anniversary Meeting of the Medico-Botanical Society, January 16, 1829. 4to. London, 1829.

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The Philosophical Magazine and Annals of Philosophy. New Series. Nos. 17 to 40 inclusive. 8vo. London, 1828-1830.

A Calendar of the Meetings of the scientific Bodies of London for 1829-30.

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Transactions of the Society of Sciences at Haarlem. Vols. 14, 15, and 16.

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Messager des Sciences et des Arts, 1827 et 1828. 8vo. Gand, 1827-1828.

Quelques Particularités concernant les Brouillards de différente nature. 4to. 1827.

Commentatio chemico-technica de Cerevisiis Belgicis. 4to. Louvain, 1827.

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Amœnitates Botanicæ Monacenses. Pars 1. 4to. München, 1829.

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Œconomy of the Kitchen Garden, the Orchard, and the Vinery, with Practical Direction for their Management. 8vo. New York, 1828.

MR. JAMES YOUNG, F. H. S.

Hortus Epsomensis, or a Catalogue of Plants cultivated by Messrs. Young of Epsom. 8vo. London, 1829.

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